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The Challenge of Change in School Finance

CEF

NEA COMMITTEE ON EDUCATIONAL FINANCE

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The Challenge of Change in School Finance

CEF

Proceedings of the Tenth National Conference on School Finance

April 2-4, 1967

St. Louis, Missouri

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Foreword

THE COMMITTEE on Educational Finance of the National Education Association sponsors the annual National Conference on School Finance to bring together researchers and practitioners to discuss this common problem of financing American education. *The Challenge of Change in School Finance* is the proceedings of the tenth conference in this series.

The viewpoints expressed in the papers presented at the Conference are the authors' own and do not necessarily reflect the views of the Committee and the National Education Association. The Committee expresses appreciation to the authors of the papers presented here for the high quality of their work.

All facets of American education are changing—the pupils, the programs, the grade structure, the staffing requirements, and the capital requirements for equipment and buildings. This Conference dealt primarily with the changes in school finance needed to support the improvement and innovations now demanded for American education.

These Proceedings include a new section, Awards for School Finance Research. The eight papers in this section were selected from among 35 abstracts of research completed by recent entrants to the corps of school finance experts. The papers were judged on the basis of the need for research on the topic, the research design, the size of the task undertaken and completed, and the research talent demonstrated. The judges were Dr. Forrest E. Conner, Executive Secretary of the American Association of School Administrators, Dr. Glen E. Robinson, Director of the Research Division of NEA, and Dr. William D. Firman, Assistant Commissioner of the New York State Department of Education.

The almost 400 persons who participated in the Conference represented local school systems, state education departments, the U.S. Office of Education, local, state, and national associations, and university professors of school administration and finance.

The Committee acknowledges the support of Dr. Sam M. Lambert, NEA Assistant Executive Secretary for Information Services and Executive Secretary Elect of the NEA; and Dr. Glen Robinson, Director of the NEA Research Division. The Committee also extends its appreciation to the staff of the NEA Research Division who organized the Conference and prepared the proceedings for publication: Jean M. Flanigan, Assistant Director and NEA Staff Contact for the Committee; Beatrice C. Lee, Publications Editor; Ann Rossilli, Elizabeth Hamilton, Elizabeth Moffatt, Frances Scott, and Patricia Zimmer, secretaries; Valdeane Rice, Administrative Assistant, and Wally Anne Sliter, Chief of the Typing-Production Section.

William D. Firman, Chairman
NEA Committee on Educational Finance, 1966-67

Greetings from the National Education Association

Sam M. Lambert, Assistant Executive Secretary for Information Services

THE PROGRAM of the Committee on Educational Finance is probably one of the best small investments the National Education Association makes. The cost to the NEA in recent years has been only $40,000 annually.

I wish we had a formula or device by which we could measure the real worth of the Conference—the dollars-and-cents value of this exchange of information among the experts and practitioners, of the information reported in our Proceedings, of the growth in expertise of personnel of state departments of education and state education associations. The yield, I am certain, would be a surprisingly large figure.

In these conferences, research in school finance has stimulated and been stimulated by leading researchers in other disciplines, economics and political science, for example. One well-known partnership was with Walter W. Heller.

The activity of the Committee has contributed a great deal to the improved climate for school support. We have spent tremendous amounts of time and energy describing education as an investment in economic growth, an investment that pays measurable dividends. Through the years the investment concept has had a tremendous impact on public and political thinking in this area. Now, it is very difficult to find a successful political leader who does not like to identify himself with the financial support of public education.

A very important internal result of this activity is the close working relationship between the NEA Legislative Commission and the NEA Committee on Educational Finance, a relationship that has enhanced the growth and development of both groups. The Committee, with the help of the staff of the Research Division, has worked on research that has been basic to the Legislative Commission's determination of the legislative policy for the NEA. This has been a good partnership that has yielded big dividends. I expect that this partnership will become even stronger and more productive in the future.

I regret that not more of our one million members know about the importance of this small phase of the NEA program. I doubt that over 5 or 10 percent of the million members of NEA even know that we have the Committee on Educational Finance or the National Conference on School Finance. You can help us tell teachers throughout the United States that this program illustrates one visible difference between the NEA and the AFT.

In the field of federal aid, I foresee the day when the federal government will be paying about one-third of the total cost of public elementary and secondary schools, and most of the third in the form of general aid. The categorical federal programs have met a national purpose, but we are now ready for a general aid program. The local and the state boards of education must now make a choice between reading and high-school science, between more teachers and higher pay for those we already have, and such recent developments as language laboratories and teacher aides. We must begin to use our financial resources to meet the highest priority needs, and local and state school authorities are in the best position to decide on the priorities.

Quality manpower is the most important ingredient of quality education. It accounts for about 90 percent of whatever quality we are ever going to have in learning. We can put a general aid program through the Congress any time we decide we want to do it. We have the potential political strength: 8 percent of the labor force is now employed in education and education-related activities and about 90 percent of the teachers vote in every election. We are not using this force effectively.

Those of you who attend this annual meeting are technicians, the highly skilled experts, and the real leaders in school finance. You like to talk about foundation programs, sparsity and density corrections, equalization, and many other technical and highly specialized areas of school finance. Do not lose sight of the basic questions: What is school finance? What is the result of all we are trying to do?

Let us try to remember in this conference and at home that our goal in finance is to see that youngsters in the first, second, and third grades learn to read and write. We are trying to guarantee that the nation's classrooms are staffed by well-trained, highly competent manpower, persons who are intelligent, patient, imaginative, creative, and productive. Please remember one elementary-school teacher affects the lives of about 1,000 persons during her career; that a high-school teacher affects about 5,000 lives. Each teacher will leave a mark, good or bad, on each of these lives. I have known teachers who could run U. S. Steel and others I would not hire for any job.

Now let me say what I was supposed to say to begin with: Best wishes for the most productive meeting you have ever had. I am glad to be with you, and I plan to be here every year if I possibly can.

School on the Moon:

Introduction

William D. Firman

WHAT IS THE SCHOOL on the moon? The phrase connotes, among other things, the space age into which we are moving with accelerating speed. It connotes changes in processes, products, attitudes, values, prejudices, behavior—changes in every aspect of human life, including, of course, education.

The concept of a school on the moon can be a useful one for educators because it projects beyond the ruins of earlier civilizations, the weathered structures of earlier establishments, the jungles of overlapping jurisdiction, the swamps of tax and debt limitations, the morasses of bureaucracy and special privilege, the walls of unilateral planning and programming and action, the forests of control mechanisms, the mountains of prejudice, and ignorance and resistance to change. It is helpful, too, because it permits the construction of models without regard to existing laws, structures, administrative arrangements, revenue systems, expenditure checks, special interests, or any one of a thousand other impediments to change. It permits the educational planner to work side by side and in harmony with those who will plan to satisfy human needs for food, water, shelter, transportation, security, and human dignity. In short, it permits us to describe the school of the future in terms of first, the goals to be achieved, and second, the arrangements to be created, the methodologies to be used, instructional and the like, the personnel to be employed, the facilities to be built, the revenue systems to be invented, or in terms of any of the other arrangements with which, of course, we have to relate ourselves in dealing with educational needs of mankind.

It is likely that parts of the school on the moon already exist in bits and pieces in school systems throughout the world. It is probable, too, that many of the characteristics to be described are to be found in good school systems across the face of America. It is the panel's purpose today to begin the task of assembling some of these pieces. Clearly, of course, the panel does not have all of the answers.

Dr. Firman, chairman of the NEA Committee on Educational Finance, is Assistant Commissioner, State Department of Education, Albany, New York.

Then, too, obviously the time at our disposal will not permit a comprehensive projection of a complete mosaic, particularly since there are likely to be components which have not yet been invented. When we have discharged our responsibilities for the take-off, there will be a point in time when you will share responsibility for continuing the flight.

Curriculum

Robert M. McClure

THE DECISIONS that I shall be talking about today are decisions that are rightfully ours as school-board members, as professional teachers and administrators, as university professors, and as other kinds of people concerned with the schools. They are rightfully ours to make. But, if you read the popular press, and indeed, the professional press of late, you will find that a lot of people are saying, perhaps rightly so, that the school as a social institution is dead. We need something; indeed the demands of society today require something a great deal different from what we now have. So, my topics are arranged around that notion although I am not certain that the school as a social institution is dead. I do think, however, that the school on the moon or the school of 1999 will be a great deal different from the school today.

I have three points to which I would like to make some comments today and go at them from several directions. These are three points that pervade much of curriculum thought today. They are points to which I believe most people in curriculum design work today are paying the most attention. First, the school is requiring more and more new kinds of learning outcomes from its students. The second has to do with organizing the school and its resources for a main purpose—to provide for the individualization of instruction. And finally, we are rapidly restructuring and redefining the substance of the school program.

An old Chinese threat or curse says, "May you live in interesting times," and indeed we do live in interesting times! Most of you know that we are currently involved in a curriculum reform movement. Most people like to think that this curriculum reform movement started in 1957 with a count-down and blast-off called Sputnik. Probably it started at least five years before that. Some of the new math studies, for example, started in 1952.

As you know the curriculum reform movement has been a national movement. It has involved academic scholars for the most part and some teachers, mostly at the high-school level. There has been a similarity of intent among the "alphabet soup" projects,

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PSSC, BSCS, SMSG.[1] You know what Begle [2] calls SMSG, don't you? "Some math, some garbage."

The similarity of intent has to do, for the first point, with allowing the student to get a grasp of the whole of the discipline (or the Gestalt if you will), the entire structure of the field. The second point concerns allowing the student to acquire, or giving him the opportunity to acquire, some of the attitudes and the skills of the professional workers in the field. In an anthropology project, for example, students are taught to work like and have the skills of and think like anthropologists. There has been great stress on the power of the individual to contribute to the growth of knowledge in a field. New kinds of learning outcomes are predicated on different activities going on in the curriculum reform movement, as Goodlad states, the opportunity to explore, invent, and discover, to develop some of the tools of inquiry appropriate to the field, and to experience some of the feelings and satisfactions of research scholars.[3]

When I was in the third grade, it was fun to look for the longest word in the English dictionary. You know what the longest word is? At least it used to be *antidisestablishmentarianism.* And it used to be great fun to play with that word. That really is the order of the day in curriculum—antidisestablishmentarianism.

Cremin [4] has asked many questions about the curriculum reform movement. The first, and it is the most important question that one can ask in curriculum, was answered by Spencer a long time ago: [5] What priorities ought to be taught to children at any given stage of their development? He also criticizes the rash of national curriculum projects in that there has been so little systematic testing of what is going on. And finally he asks that we carefully examine the thought by Jerome Bruner that has so affected the curriculum reform movement—that knowledge does not have to be recast for the purpose of teaching.[6]

Phase two of the curriculum reform movement you could define as the business of planning the total curriculum, putting the bits and pieces together again. It is essential that all the decision-makers play their appropriate role in closing the knowledge gap. The best revolution of curriculum and teaching will occur when a soundly educated teacher can make wise instructional decisions based on the work of his curriculum-making colleague.

The NEA Center for the Study of Instruction has published a new book on putting the bits and pieces of the curriculum together. It is called *Rational Planning in Curriculum and Instruction: Eight Essays.*[7] I should also like to refer to *A Summary of the Report of the NEA Project on Instruction.*[8] Selection of content and setting of priorities is discussed in this booklet, particularly on page 11 under "Selecting Content" and on page 12 under "Organizing Content."

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[1] Physical Science Study Committee, Biological Sciences Curriculum Study, and School Mathematics Study Group.

[2] E. G. Begle, director of the School Mathematics Study Group.

[3] Goodlad, John I. "The Curriculum." *Rational Planning in Curriculum and Instruction: Eight Essays.* Washington, D. C.: National Education Association, 1967. p. 5–31.

[4] Cremin, Lawrence A. *The Genius of American Education.* Horace Mann Lecture, 1965. Pittsburgh: University of Pittsburgh Press, 1965. 122 p.

[5] *Ibid.*, p. 56.

[6] *Ibid.*, p. 57.

[7] National Education Association, Center for the Study of Instruction. *Rational Planning in Curriculum and Instruction: Eight Essays.* Washington, D. C.: the Association, 1967. 203 p.

[8] National Education Association, Center for the Study of Instruction. *A Summary of the Report of the NEA Project on Instruction: Schools for the Sixties.* Washington, D. C.: the Association. 16 p.

Bloom in *Taxonomy of Educational Objectives*[9] discussed six levels of learning: knowledge, comprehension, application, analysis, synthesis, and evaluation. The school of today has not required students to move above level one or level two for the most part. In the future, students will do less memorization or acquiring of knowledge of soon-to-be obsolete facts and engage in more activities like analyses of relationships, production of unique communications, production of a set of operations, judgments in terms of internal evidence, and the like.

Schools will also have different and enlarged expectancies in both the cognitive and affective domains as treated by Bloom and others. We are learning much more, for example, about how values are formed and how satisfactions are achieved. These expectancies will be reflected in the school on the moon in four ways:

1. The curriculum will be enlarged, particularly in social sciences, i.e., anthropology, political science, psychology, and the emerging disciplines in the social sciences. The school will provide an appropriately balanced program for each student. This does not mean that all students will have the same program. The school on the moon will have some of the content of today's schools eliminated and some other things expanded.

2. The second point is that instructional materials designed to reflect the new nature of the curriculum and new student outcomes will be evident. All manner of media will be present: teaching machines, computers that will simulate situations, as well as more films, books, tapes, records, and so on. There will be much greater emphasis on materials that students can use independently since the recurring theme in education in the 70's and 80's and beyond will be self- and lifelong learning.

3. The third implication is a smaller student-adult ratio in the school. More importantly, the competencies of the adults will be different and their responsibilities will be more varied. Hence, there will be a few very highly paid teachers, others who will receive an average salary, and still others with little training who will receive less. I think the key words in personnel assignment in the school on the moon will be *certificates* and *credentials, merit, experience,* and *success.* And staff responsibilities in the elementary or secondary school will be defined in these words.

4. The fourth point is that the length of the school day and the length of the school year will be different from what they are today. Some students will go to school longer than they do now; others will go to school for a shorter time. Scheduling of students and staff will be a great deal more important than it is today. The school building will be used more, both by regular students and by students from such other educational institutions as Job Corps, Headstart, and Adult Education.

Now let me quote Marshall McLuhan and George B. Leonard. They say:

> Mass education . . . reached maturity just at that historical moment when Western civilization had attained its final extreme of fragmentation and specialization, and had mastered the linear technique of stamping out products in the mass.
>
> It was this civilization's genius to manipulate matter, energy and human life by breaking every useful process down into its functional parts, then producing any required number of each. Just as shaped pieces of metal became components of a

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[9] Bloom, Benjamin S., editor. *Taxonomy of Educational Objectives.* New York: Longmans Green and Co., 1956. 207 p.

> locomotive, human specialists become components of the great social machine.
>
> In this setting, education's task was fairly simple: decide what the social machine needs, and then turn out people who match those needs.[10]

That age has passed, more swiftly than we can realize. We are moving into a dazzlingly different era. Fragmentation, specialization, and sameness will be replaced by wholeness, diversity and, above all, a deep involvement. TIME magazine, in criticizing today's philosophers, asks a very significant question, "Will philosophy ever again address the heavens? Will it contribute anything to man's vision rather than merely clarifying it?" [11] Indeed, I think we might ask the same question of our schools for today and for those on the moon.

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[10] McLuhan, Marshall, and Leonard, George B. "The Future of Education: The Class of 1989." *Look* 31:23–25; February 21, 1967.

[11] *Time*, January 7, 1966, p. 24.

Staffing the School

James L. Olivero

BEFORE WE CAN TALK about staff assignments, we need to know the nature of the school's objectives and what problems exist in meeting these objectives. Let us suggest, then, that for the purpose of the presentation today, we are moon people and we have identified the following problems.

First, we need to solve the problem of a shortage of quality teachers. Some statistics suggest that we are 72,000 teachers short. Research has found that 60 percent of the teachers who graduate in June of one year are not teaching five years later. Ten years ago the reason for leaving teaching was immediately related to poor salaries. Today, however, salary ranks number five.

We need to make education more meaningful, more useful, in order to lead the children out of the slums. We need to concern ourselves about education for the service tradesmen as well as the scientist. We need to develop well-rounded citizens who can survive in a world of unlimited mobility, of constant change, of greatly increased leisure, and of longer retirement.

Third, we need to provide more school buildings to house the booming enrollments and to rebuild or replace out-moded structures.

Looking at the available research on staffing and learning processes, we find barriers to change. Some of the barriers are:

1. We have assumed that the optimum size class for all educational purposes is 25 to 30 pupils or a pupil-teacher ratio of 27 to 1. We have said that if we can reduce class size from 31 to 29, we will have resolved all the ills of education.

2. We have said that one teacher alone should be responsible for the

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classroom instruction in a subject or a grade.

3. We have said that pupils learn best by reading and by listening to the physically present voices of the teacher and other pupils in a self-sufficient classroom.

4. We have said that a subject is learned best if a pupil is in a classroom 280 minutes a week for all subjects, and all subjects should be scheduled for a 55-minute period each day.

5. We have said that a 7-period day is better than a 6-period day and vice-versa.

6. We have said that teaching will be better if teachers have one free period a day for preparation and conferences, when indeed recent research suggests that teachers spend 2.3 hours per day on trivial but necessary things.

7. We have said that all elements of pupil learning should be under the direct supervision of a teacher with 18 semester hours in education and at least 18 hours in his subject field.

8. We have said that the quality of learning is measured by the number of books in the library in proportion to the school enrollment.

9. We have SMSG math, CHEMS chemistry, and PSSC physics.

As we explored each of the curriculum offerings, we found that one thing really makes a difference in how children learn. And that one thing was the teacher. Unfortunately, our teachers are so busy doing nonprofessional things that they are often not able to get down to the job they were educated to do—indeed, to teach! In short, the teacher was not performing as a professional.

We then determined that there must be a better staffing arrangement whereby teachers, on the one hand, could receive the benefits available to true professionals, while on the other hand providing the kinds of learning experiences for each Johnny, Billy, and Mary in the classroom. At a planning session, some moon men could be heard tossing around a number of ideas. Even the restrained notes of the impossible dream did not drown the anxious and often hysterical cries of some of the people in the idea tank. When the dust cleared, they had a plan which they elected to try.

The plan included the use of both professional and nonprofessional personnel. At the top of the staff hierarchy there would be a person with a doctor's degree called a professor. This teacher would have a joint assignment with the university and the local school system, and would work with the university in the development of curriculum and in the education of teachers. He would also have a class at the local school. His major efforts, however, would be devoted to assisting student teachers and beginning teachers, and helping to determine courses of study. His main function would be to bridge the gap between university and school.

The next level would include the senior or the master teacher, a holder of a master's degree. This person would work with a team of other teachers as a major decision-maker about what learning activities and experiences Billy and Johnny need to have. He would be responsible for learning decisions for 200 children, but his structured time with children in typical class arrangements would never be greater than four hours a day. Thursdays would be reserved for teaching and for thinking. The first two levels of the hierarchy would not be tenure positions.

The third level of the differentiated staff would be called the associate teacher. These teachers would come from the housewives' ranks; they would work two or three hours a day, maintaining the professional competency and understanding of educational changes as they raised their families. The idea was not to lose these people as they raised their families and indeed to encourage them to come back into education and into teaching when their families were raised. They would fulfill specialist roles such as manning language laboratories, resource centers, and data-processing centers. The associate teacher would be available for many of the extracurricular activities as continued efforts would be made to include the after-school and evening activities as an integral part of the school system.

All of the levels described above would be manned by certificated individuals. Promotion, however, would depend upon performance of the responsibilities assigned as opposed to growing older on the job or taking two courses on such topics as "The Measurement of Two G Gravitational Relationships" in an inservice education course at a nearby university.

Teacher aides would assist with the mechanical operations and bookkeeping chores, and would monitor and supervise other activities and lunch areas. The number and kinds of supportive staff would be determined by needs as identified by professionals rather than by counting the dollars and dividing by a prescribed formula of set figures. The decision for staff would be pragmatic, not dogmatic.

Other supportive staff members would be available when needed; for example, a complete staff of medical, psychological, and other specialists would be on call. In addition, we would have some systems development people who would focus on research and evaluation and the relationships of man, media, and how they can work together more effectively. Because this school would be a model, we would need to include someone, called a disseminator, to handle all the visitors and someone to handle the important public relations in the new school.

Let us say that we have implemented the program. After a year of trials and tribulations, and certainly any new program is usually accompanied by a syndrome of growing pains, we can say, "We have met the enemy—ourselves."

School Facilities on the Moon

Stanton Leggett

In our usual fashion in education we have blasted off, and we will now start to build the rocket. We are going to the moon and should try to describe lucidly the physical requirements that will house the program the philosophers have given us.

First, I doubt that we should be going to the moon. One can make a fair case for a kind of galactic quarantine of this planet. I am not at all sure that we should infect neighboring pieces of

---

Mr. Leggett is a member of Engelhardt, Engelhardt, and Leggett, Educational Consultants, Purdy Station, Westchester, New York.

real estate with the peculiar kinds of behavior we have. But, one cannot be completely pessimistic.

In our world there are spots of hope and occasional bits of warmth of one person toward another, not paid for or asked for. A few people have had some very soaring aesthetic accomplishments, and there is occasionally a fanatic with some vision of a beautiful world.

Creative Space in Buildings

As we look at the future society and the school involved, we will have some ideas about what the buildings will be like. We shall bring children back into the life of the community and the world. We shall have stimulating people to work with them. We might even go back to apprenticeship and put a child alongside an artist or a mathematician and each one will have time to teach him.

The kind of school toward which we are currently moving can best be expressed by that horrible pile called Habitat at EXPO 67. Habitat is a completely interchangeable space in which one level is piled on top of or next to another. These levels keep going up. Out of the confusion comes its own curious kind of quality. I suggest you look at it as what we could ultimately come to in the world. I am not sure, however, that this is the kind of school we want on the moon or on earth.

The Student Union Building at Sarah Lawrence College has a lounge that, curiously, is used. Lounges usually are for loners. But this lounge is different because it has no big spaces in it. It is composed entirely of corners. One always finds one's self backed up into a corner, sort of Hemingway-like. I think children like that. They like to be important and know that they are individuals. I think they hate the open school, with acres and acres of Bigelow carpet, open beyond belief. It is like a carpeted subway platform, a great place to mill in. Do you think children like to mill? I do not think they do.

We might even give up the lecture rooms. Harvard rediscovered the lecture about 1952. Until that time we had almost gotten to the point where we could say, "If the professor would spend the time to write, we could print his ideas. The students would read them if they wanted to use them." But no, now we are going back to where large numbers of pupils are sitting somnolently in a large room while a teacher drones on. In the future, we will solve that problem if we really work at it. I think we will have suppressed gadgets and will absorb them into our life. So if you want a retrieval system, plan one, but do not make a fuss about it. And a computer is fine to simulate a project.

Space in the school of the future does not mean large areas, but space that is related to people. Read E. T. Hall's book, *The Hidden Dimension,*[1] and look at those wonderful photographs of people and of seals. Seals are piled up on the rock beach by the hundreds and thousands. It looks like an open classroom, with great big spaces that are seal-carpeted.

One of my great friends, Bob Hall, a West Virginia superintendent called me one day in despair and said, "Leggett, you goofed again." I agreed. He said, "The trouble with our library is that it has wall-to-wall kids."

Another instance is the great classical experiment in behavioral psychology. When rats were forced into a space that was smaller than they could live in, they went to hell. Their living space became a behavioral sink. Family life disappeared, the area was dirty, homosexuality increased, shiftlessness increased, and I presume drunkenness, LSD, and all these things came into play.

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[1] Hall, Edward T. *The Hidden Dimension.* New York: Doubleday and Co., 1966. 201 p.

Now think of children again. What are they like? Can they be forced into excessive numbers and impersonal spaces? Will they have spaces among themselves? Do they space themselves as people? I think if we really worked at this school, we would not have any of the kinds of schools that have been described. We would probably build the schools from the point of view of the child. It might be refreshing to have a student module instead of a time module.

Student Enterprises

We are dealing with children in planning and time and space and giving them the opportunity to become involved in enterprises. An aphorism that goes with this is that independent work, as I have seen it in schools, works best in small groups. This is generally a kind of bull session in which two or three students stretch their minds. Maybe we need lots of student modules in which this can happen, even with a teacher or an aide present some of the time. As we look at schools, we see enterprises operating in these spaces.

Whenever we do anything that is considered important, we make an enterprise of it. The football team, the basketball team, bands, and publications are examples. All of these things that are important in the school occur in a peculiar way in which there are beginners and trained craftsmen. Boys join the football team and start off with the freshman squad. As they are trained, they slowly come into the game as substitutes and work alongside the seniors to gain experience.

We have learned a little bit, in dealing with disadvantaged children, that one way they learn is when placed with older students who, in turn, learn in the process. Maybe we need space in this school of the future for enterprises. When there is an important enterprise, put the children in it.

I have seen a very interesting project operating in industrial arts which represents the ultimate in innovation. A group of four or five tenth-graders sat around with an instructor and talked about a Buckminster Fuller dome. They tried to decide what kept the dome up. They finally assigned themselves the task of designing the connector of the dome because they figured that this was probably the secret. They also proposed to design it, put it on a manufacturing line, price it, package it, and prepare it for sale.

Their first innovation was to go to the library. Can you imagine going to the library for information about industrial arts? Usually one goes to the tie rack. This was an attempt at inquiry, an approach to the whole idea that one could actually design it oneself, figure it out, see why it worked, and put it on a production line. And they did it.

This was the first stage and it continued. This shop had space and some utilities in it, but little else. It had some storage place for equipment, but all the pieces of equipment were not out on the floor. The students did not bother with 87 different student stations in the machine shop. They did not need much equipment. It was stored in a corner, and when they needed it, they took it out and plugged it in. They were used to doing it. They got this project going, and then left it a while. They later started the enterprise again.

Another group of students who had no experience with the manufacturing company or the dome were introduced to the program. The original students showed the new group how to work the manufacturing devices and the equipment along the line, and soon the new group was producing good connectors. And then the great thing that the instructor hoped would happen happened. A couple of students at the end of the line said, "Gee, I think this a crude operation, and I think we could do better." So the enterprise continued, and the boys went back to the drawing board in the design stage and refined the idea of a connector.

And I hope that schools will find enterprises that they can keep going until they have outlived their usefulness, inserting students into it to gain experience, pulling them out, and looking again at the product they are dealing with. This whole question of development of creativity should be considered. We can teach students to think and the next step is to inspire them to be creative.

Communication

Another impressive project I have seen was in the development of communication skills. One of the best ways to learn these skills is to have something to say. The parallel to it is a media laboratory. In this office, which has the capability of effective use of a wide variety of media, the learning of students in communications skills will get a little reinforcement, to borrow a bit from Marshall McLuhan. Out of this comes an exciting look at schools. Ideas are translated into words that are refined and printed. And you find yourself as a student involved with these kinds of experiences and attitudes.

Our school on the moon is like a loft in places, but it has carefully placed retreats, corners, and secret gardens because this truly should be a place of serenity and quiet. A student should feel happy and enjoy being in his school. In short, it will not resemble anything we have today.

Financing

William D. Firman

Do YOU FEEL AS though you are looking in on a strange new world? We are moving in that direction and are thinking about changes in curriculum, staff, and facilities. In a sense, I propose to be a connector between what has been discussed and your primary field of concern, research in school finance work. If we are going into the world that has been described, it will mean changes in the ways that we look at the financing of schools.

I will generalize about two or three things that I think might happen. Then you can suggest other related possibilities that might happen in the finance field.

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First, we shall spend a higher percentage of our gross national product, or whatever it may be called at that time, for education. Because I think by then it will be clear to everyone that education really is an investment, in the best meaning of the word. As we increase our contributions to the educational enterprise, we shall expect to get values from it that are worthwhile.

Second, we shall move toward a cost-sharing formula in which there will be no ceiling. The amount of money spent for the education of children will be directly related to the unique educational needs of youngsters who are quite diverse. There will be multilevel funding with broad tax bases. There will be inter- and intra-governmental planning and budgeting by program with input, output, analyses, and evaluations, not only in education, but also in every other function which we will be performing. These analyses and evaluations will control, at least in part, the distribution of expenditures.

Third, quality of education and equality of educational opportunity will be the major considerations in expenditures. Personnel services will continue to absorb a major share of expenditures, as a percentage, perhaps even an increasing share, because we will be effecting economies in other ways. Mass transportation for everyone will probably be financed from tax revenue. We shall have universal insurance coverage. Maintenance and operational expenditures will decrease. And the great economies may come through an elimination of overlapping jurisdictions: water systems, sewage disposal districts, police protection, and fire regions.

Stanton Leggett criticized present space arrangements of school buildings and large classes. He pointed to the number of adults who are involved with children. He thinks that here is where the answers lie. I suspect, as we have less need for people in production and in other ordinary aspects of life, we shall have a vastly increasing opportunity to utilize people in education. He said we shall arrive at the point where more adults become more concerned with more children. This is why he would move away from working in very large groups. He said that the most stimulating groups in which he had participated involved only three or four people.

The Challenge of Change in School Finance

Wendell H. Pierce

CONSCIOUS OF THE urgent need for new approaches to the problem of school finance, the Education Commission of the States has designated "Financing Elementary-Secondary Education at the State Level" as one of its key studies. Dr. H. Thomas James, Dean, School of Education, Stanford University, has been named chairman of the advisory committee for this study. Other members are Charles Benson, University of California; Francis S. Chase, University of Chicago; R. L. Johns, University of Florida; James A. Kelly, Columbia University; Erick L. Lindman, University of California, Los Angeles; Edgar L. Morphet, Project Director, Designing Education for the Future; Richard Musgrave, Harvard University; Lloyd Nelson, University of Southern California; James Alan Thomas, University of Chicago.

Through a series of meetings this group of experts has analyzed the problem as follows:

Public elementary and secondary education is, and will remain for some time, the most important function of state and local government in the United States. Education, including higher education, as a governmental function accounts for almost half of state and local public employment and expenditures. In the period ahead to 1980, public elementary- and secondary-school enrollments will continue to grow, but at a slower rate of increase than during the period 1947 to 1965. Enrollments in public higher education, on the other hand, will increase at a greater rate than in the recent past, as the "baby boom" passes through the ages of college attendance.

If for no other reason than the magnitude of resources utilized in the total public educational system, public policies concerning education are being increasingly examined. Focuses of this attention are the effective and efficient use of present resources, and the choice of objectives to be served for various population groups through various methods involving new combinations of resources. Rationality and research are increasingly the bases of policy decisions in the total public sector, and in education in particular, as trained scientists from a number of disciplines examining past and present practices present new data, develop new analytical tools, and generate new hypotheses.

To provide a basis for policy decisions for financing public elementary and secondary education, analysis of past and present state school finance plans in the United States is proposed

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as a basis for a publication that permits rational evaluation of state school finance plans.

State Finance Plans

Almost every one of the 50 states has enacted a complex system of laws defining the financial relationship between the state and local school districts. These laws and their effects are periodically studied and reviewed. Minor changes and major new systems emerge from these state studies. Descriptions of the almost 400 separate distributions of funds to local school districts in the various states are presented periodically in detail by the U. S. Office of Education. This mass of information, however, serves more to highlight differences and distinctions rather than to expose similarities. Owing to both the complexity of subject matter and the unstructured mass of information, only a few persons, if any, in each state are knowledgeable with respect to school finance plans.

The proposed study will remove much of the obscurity from state finance plans by reducing all plans to a common language (forming a glossary of terms) to describe the elements and the relationships among elements in theory and in law.

The elements examined will be simple, for example, pupils. The various ways in which pupils can be counted will be enumerated, and the relative merits, as seen by professional and political leaders, for selecting one rather than another method for enumeration will be indicated. For instance, fall enrollment, average yearly enrollment, average daily membership, and school census, will be listed as ways of counting pupils, and the advantages and disadvantages of each basis of counting will be indicated. Thus, descriptions of state finance plans will rely upon carefully defined elements. This technique will make possible evaluations and redefinitions of the existing elements in particular finance plans.

Theoretical and statutory relationships between elements will be analyzed. The unique theoretical framework presented by Musgrave in *Public Finance: Needs, Sources, and Utilization*[1] will be used to classify grant programs as to objectives and likely outcomes. Although the Musgrave classification is highly mathematical, it will be stated verbally in terms which a lay person can understand. The advantage of this classification lies in its comprehensiveness not only over existing types of grants but also over possible future developments.

The relative merits of different grant programs will also be gathered from professional literature, study group reports, and statements of political leaders. However, in many instances, theoretical arguments for and against certain plans will need to be developed, as there is no experience, or there is only limited experience, in their use.

Finally, the legal language used in state school finance plan statutes will be presented, following the same progression of definitions, analyses in theory, and descriptions of operating state plans. This step is necessary as many states will have common elements and common relationships, in mathematical terms, to specify different aspects in their statutes. Over time, these aspects affect the decisions which are made. The statutes thus become constraints upon decisions. Some methods of specification allow greater leeway than others to decision-makers. In this phase of the study, a careful analysis will need to be made of actual effects of different methods of specification. No such analysis has been undertaken heretofore.

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[1] Musgrave, Richard A. "Approaches to a Fiscal Theory of Political Federalism." *Public Finances: Needs, Sources, and Utilization*. A Conference of the Universities—National Bureau Committee for Economic Research. Princeton, N. J.: Princeton University Press, 1961. p. 97-133.

Method of Study

The task of collecting recent state studies of financing public elementary and secondary schools is already under way. These recent state studies, recent legislation, and compilations of state finance plans since 1947 will provide the basic data for analysis.

Elements of state finance plans will be determined and classified in groups as alternative choices. Rather than a complete catalogue of all possible elements proposed at some time, simplicity of presentation will call for most attention to those used most frequently. Similarly, with respect to relationships, major emphasis will be on the most prevalent models. When there is consensus that a certain element or relationship is either excellent or poor, these elements or relationships will be highlighted.

The compilations of state school finance plans will identify the states that have had recent changes in such plans. The treatment of studies and recent legislation will identify the relative impact of professional groups and political leaders. This study will analyze objectives for state aid other than the equalization objective, almost the only one proposed by professional educators.

Dissemination of Results

A single major publication is planned, which will include:

1. How To Develop and Evaluate a State School Finance Plan
2. Elements of State School Finance Plans
3. Relationship of Elements in Theoretical Models
4. Differing Legal Statements of Identical Models
5. Description of State School Finance Plans, by State
6. Glossary of Terms.

Other minor publications on various aspects of state school finance plans may be forthcoming as data are gathered and analyzed. Another section may be added to the major publication to explain the operational requirements for the Musgrave models that are not used, but which seem appropriate for some objectives. For instance, one of the Musgrave models requires computers to solve simultaneous equations related to the decisions of local school officials. The computation determines the relative assistance from the state to each local school district. For this section, one would need to look ahead at operational problems of state finance plans about which no experience exists. The performance of this task depends on the gathering of information on various prototype operations relevant to the proposed model. For example, the Kansas Legislative Council computer program and data bank for evaluating different finance plans could serve as such a building block.

The task of collecting and checking needed information will be used as a means of feeding back information to the states, and also as a means of feeding in new ideas and information to the research effort. At least, two persons, an educationist and a lay citizen, in each state will be asked to examine the material. The technical review is not only an additional check on accuracy and a test of the utility of the common language developed, but also an attempt to gain the educationist's acceptance of the material as a valuable tool for decision-makers within the particular state. The lay person will assess the utility of the publication as a device with which citizens of the state can evaluate state school finance programs. This review will indicate revisions and also conditions for publication widely used. Techniques for dissemination may arise from each of these reviews. Both reviews should serve to identify resource persons in the various states who might act, with respect to the materials developed in this study, as communications links within and among states.

Other Outcomes

The results of the project could be used by the Commission as a basis for policy recommendations for state-local and, if desired, for federal-state-local school finance plans.

This comprehensive research study will take a number of years to complete. The design, as you will note, does anticipate the release of pertinent survey and analysis information periodically during the study. Through the process of the study, the advisory committee hopes to develop a number of young scholars with special knowledge and skills in this area to keep up a steady flow of up-to-date information, and also to have available personnel for consulting services to the states.

This study will answer many of the questions in this area, but will leave unresolved some major educational and political issues bearing on the financial problem:

1. The necessity for the development of long-range plans for the improvement and financing of education with close interrelationship among local, state, and national governments

2. The importance of each state having a true commitment to a financial structure necessary to equalize educational opportunity within the state

3. The importance of each state's commitment to innovation, research, and personnel necessary for effective fiscal planning for schools

4. The urgency regarding each state's commitment to adequate financial assistance to urban centers

5. The necessity for state and national governments to develop techniques of balancing education expenditures among the levels of education

6. The importance of the federal government re-examining the procedures of Congress to make possible effective planning at local and state levels, with lead time of appropriations and some assurance of level of expenditure over a period of years

7. The necessity for the federal government (in future legislation) to equalize educational opportunities among the states

8. The careful study for relative merits of categorical aid, block grants, and general aid

9. The preparation of plans for the potential of massive federal aid for school construction at the elementary-secondary level

10. The study of the best techniques for the administration of tax rebates to the states from the federal government.

The Education Commission of the States was developed to stimulate state action to improve education in the states and to furnish a mechanism through which the states might influence educational policies being developed through federal legislation.

The issues to be found in the problems of school finance illustrate the kinds of studies, service, and influence this new organization may be able to offer the educational and political decision-makers.

Criteria for Evaluating Federal Education Programs

Erick L. Lindman

AN IMPORTANT STAGE has been reached in the development of federal-state-local relations in education which requires a comprehensive evaluation of existing federal programs, especially those enacted in recent years. This is a difficult task. It involves gathering and comparing evidence concerning the social utility and individual benefits of many interrelated educational programs with their costs. Although it is easy to talk about "input-output analyses" and the "cost-effectiveness ratios" of educational programs, the actual process of comparing costs and benefits is extremely complex.

The first step in the evaluation process is to decide what evidence is needed, and what criteria will be used for assessing the merits of each federal program and the combined effect of all federal programs in education. Three basic questions must be answered: (a) Is the purpose of the program worthy and appropriate to the federal government? (b) Are the administrative arrangements effective and conducive to sound federal-state-local relationships? (c) Does the combined effect of all federal programs promote the development of adequate public schools in all states?

Historically, there have been two major efforts to establish criteria for federal programs in education. In 1931, the National Advisory Committee on Education, appointed by President Hoover, issued a report entitled *Federal Relations to Education.*[1] In this report the Committee declared that the American people are justified in using their federal tax system to give financial aid to education in the states, provided they do this in a manner that does not delegate to the federal government any control of the social purposes or specific processes of education. This committee also emphasized that federal funds should be granted to the states to aid education as a whole and not as special grants for the stimulation of particular types of training, and that the federal government should render large "intellectual assistance" to the states in matters of education through scientific research.

This report, issued in 1931 under a Republican Administration, suggests

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[1] National Advisory Committee on Education. *Committee Findings and Recommendations.* Part I of Report of the National Advisory Committee on Education. Washington, D. C.: the Committee, 1931. 140 p.

criteria which would be equally applicable today. A few years later, in 1938, a new committee appointed by President Roosevelt gave its views concerning the role of the federal government in education. The report of the United States Advisory Committee on Education[2] stated that grants should be made available to the states for "all types of current operating expenses for public elementary and secondary schools"; that the states should be permitted to use part of their federal funds for books, transportation, and scholarships for children attending both public and nonpublic schools; and that the American people would rightly object to any attempt to use the federal aid as a means of controlling the content or processes of education in school. Thus, the committee appointed by President Roosevelt also favored general purpose grants without federal control in preference to categorical aids for education.

Despite these announced principles, the distrust of state and local management of public education which characterized the past decade ushered in a period of proliferating federal categorical aids for education. These special programs must now be re-examined and evaluated.

Is the Purpose of Each Program Worthy and Appropriate to the Federal Government?

In deciding what educational purposes are worthy and appropriate for the federal government, first consideration should be given to those educational problems that transcend state lines. Recent events have shown that educational neglect in one state can be a factor contributing to riot in another. Since educational deficiencies cannot be quarantined within state boundaries, educational isolationism practiced by individual states cannot be sound national policy. The federal government clearly has a responsibility to act to strengthen public schools in all states. Only by so doing can a state be protected against the spillover effects of educational neglect in other states. Thus, one worthy and appropriate purpose of federal action is to make general purpose grants to states to supplement state and local funds and to encourage states to expend for public schools amounts needed to maintain an adequate basic school program for all children and youth who choose to attend the public schools.

In addition to its general concern for strengthening the total ongoing public school program in each state, the federal government has a special responsibility to assist in the education of disadvantaged children. This responsibility has its origins deep in the history of our country, although immediate concern arises partly from the large number of educationally disadvantaged families that have migrated from one state to another in recent years. Thus, a second worthy and appropriate purpose of federal action is to provide special purpose grants for compensatory or remedial education to assist states in educating disadvantaged children.

The federal government has increasingly accepted responsibility for reducing unemployment, and Congress has in recent years enacted a number of laws to this end. But unemployment cannot be eliminated without suitable vocational education programs in all states. To meet its responsibility for full employment, a worthy and appropriate purpose of federal action is to provide special grants to states for vocational education, including vocational programs for adults.

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[2] Advisory Committee on Education. *Report of the Committee.* Washington, D. C.: Government Printing Office, 1938. 243 p.

The chief source of local revenues for public schools is the property tax. More than half of all revenues of public schools are derived from this source. The federal government is the largest property owner in the United States, and its property is tax-exempt. This obviously leaves a large gap in the tax base of America's public schools. A worthy and appropriate purpose of federal action is to remedy this gap by making contributions to public schools to compensate for deficiencies in the school tax base resulting from the tax-exempt status of federal property.

In the past the federal government has made contributions for the education of individuals for whom it accepts a special responsibility. The education of Indian children is a case in point. More recently, contributions have been made for the education of veterans and for Cuban refugees. These obligations have been properly accepted by the federal government. It is, therefore, a worthy and appropriate purpose of federal action to contribute toward the cost of education for veterans and for other individuals for whom the federal government has accepted a special responsibility.

Common to all states is a need to improve education through research and development programs. If each state were to finance all of its own educational research and development, excessive costs or inadequate programs or both would be inevitable. Therefore, as a service to all schools, it is a worthy and appropriate purpose of federal action to finance research and development programs designed to improve the quality of education in all states.

If a federal educational program is designed to accomplish one or more of the foregoing six purposes, it should receive a favorable rating under question number one.

Are the Administrative Arrangements Effective and Conducive to Sound Federal-State-Local Relationships?

Worthiness and appropriateness of purpose are not enough. If the federal-state-local partnership is to function to maximum advantage, the assignment of responsibilities to each partner must utilize the special strengths of each while compensating for his weaknesses. Moreover, each partner must perform his duties without interfering unnecessarily with the essential contribution of the other two partners.

Historically and legally the state government occupies a central role in the public school partnership. If the total public school program is to function effectively, the state must be in a position to coordinate federal programs with state and local programs and to provide needed supervision and direction. For this reason federal programs should not bypass state governments; instead federal grants for public schools should be made to state departments of education to be allocated to local schools by them in accordance with state plans. This arrangement not only respects the central role of state governments in education, but also avoids excessive growth of the federal bureaucracy.

Over a period of years, states have developed elaborate plans for granting state funds to local school systems. More recently, the federal government has launched a number of categorical aid programs. Inevitably some of the new federal programs duplicate the purpose of some existing state-aid programs. For example, some states have provided aid to local school districts for compensatory or remedial education. With the recent entrance of the federal government into this field, it may be in the best interest of education for the state to transfer some of its funds to other equally important purposes. To permit such flexibility in the use of state funds, when the federal government and a state grant funds to local school districts for the same or for closely related purposes, the federal grant should not be contingent upon continuation of the state grant. Only by preserving the right of the state to adjust its grant program can the state discharge its obligation to the over-all education partnership.

The amounts of federal funds to which individual states or local school districts are entitled should be determined by objective formulas, reducing to a minimum discretionary power of federal officers in the allocation of school funds. Any grant-in-aid program which authorizes federal officers to use broad discretion in the allocation of school funds among states or local school systems will encourage political favoritism, and another by-product will be the proliferation of expert proposal and justification writers.

To promote the efficient use of federal funds and to encourage sound state and local planning, federal contributions should generally be predictable for long-range planning purposes and specifically predictable for year-to-year planning. Effective use of federal grants requires not only planning, but also sufficient lead time to recruit personnel and obtain facilities and equipment. Boards of education should know at budget-making time the amount of federal funds they will receive during the ensuing year.

In the interest of effective administration and sound intergovernmental relations, the federal government should avoid having several departments grant funds for the same or closely related public school purposes. For example, several programs of vocational education are administered by different agencies making grants to local school systems. A single federal program working through a comprehensive state plan for vocational education would avoid much confusion and would be more effective in achieving the purposes of the federal government.

The accounting and auditing safeguards for federal grant funds should utilize the procedures that the states require to safeguard their grants to local school systems. Separate accounting and auditing procedures for federal funds should be superimposed on state requirements for local accountability for state and local funds only if the latter are inadequate. Moreover, although the federal government might in the case of categorical grants specify the purpose for which the funds are to be used, great freedom should be allowed to the local school system in selecting the method by which the purpose is to be achieved. This type of operational freedom is necessary if the local partner is to do his job effectively.

These criteria should be helpful in determining if the administrative arrangements of a federal program are effective and conducive to sound federal-state-local relations.

Does the Combined Effect of All Federal Programs Promote the Development of Adequate Public School Programs in All States?

Evaluation of the federal government's activities in education cannot be made by looking only at each individual program; in addition, the combined effect of all programs must be considered. It is only in this way that gaps can be detected and that the cumulative effect of various programs can be assessed.

Serious questions have been raised about the effective operation of federal aid programs. It has been charged that the combined effect of numerous categorical aids has produced a deluge of red tape that has hampered public school functioning; that educational talent is being wasted in writing up applications for small amounts of federal money; that the emphasis upon innovation, and the search for funds to subsidize it, has resulted in the neglect of programs which have proved valuable in the past. In short, there is a growing conviction that the expanding list of federal categorical aids has produced confusion, instability, and distortion of educational emphasis.

It is hoped that the proliferation of small federal grants for special programs and projects in education has run its course and the nation is ready to re-examine and to consolidate these grants into broad programs of continuing support for education. Before this is done, it will be useful to consider new plans for the disbursement of federal funds, such as tax-sharing arrangements (the Heller plan) as well as general federal aid for education proposals.

The tax-sharing plan, under which a part of the federal income tax revenues would be returned to the states for general governmental purposes, has certain advantages. It places greater responsibility upon state legislatures, and it does not penalize in any way the state in which a large proportion of the children attend parochial schools. Also, most tax-sharing plans are designed to benefit, in addition to education, other important services traditionally rendered by state and local governments, thus improving the total operation of public services.

On the other hand the tax-sharing plan affords no assurance that states will provide satisfactory programs of public education. To provide such assurance, it may be necessary for the federal government to adopt a public-school incentive plan in which payments are made to states in proportion to their expenditures for public schools.

Under such a plan, a prescribed percent of state and local public-school expenditures would be multiplied by state matching ratios, computed by dividing the national average per-capita income by the per-capita income of each state. For example, if the prescribed percent were 10 percent, a state in which the income per capita equals the national average would receive a federal grant equal to 10 percent of the amount it raised for public schools from state and local sources. However, a "poor" state in which the income per capita equals one-half of the national average would receive a federal grant equal to 20 percent of the amount it raised for public schools from state and local tax sources. And a "rich" state in which the income per capita equals twice the national average, would receive a federal grant equal to 5 percent of the amount it raised for public schools from state and local sources.

The federal responsibility is clear. Without a federal tax-sharing plan or some form of general federal support for the ongoing public school program, there is no assurance that all states can and will develop adequate public school programs. And without the development of adequate public school programs in all states, the federal government falls short of discharging its responsibility to the American people.

Summary of Proposed Criteria for Federal Grants to Public Elementary and Secondary Schools*

The federal government can contribute much to elementary and secondary education. It brings to the local-state-federal partnership in education:

- A national perspective on the need for education with a view to implementing basic national goals such as national defense, economic growth, full employment, and civil rights
- A financial resource for school support unhampered by low economic ability and unfettered by state and local fears of losing individual and industrial taxpayers to low-tax areas
- A large-scale ability and efficiency in research and development programs of common value to educational improvement in all states.

But there are inherent limitations to the federal role:

- While education is the only concern of the local board of education and is a major concern of state government, it is but one of many concerns of the federal government. In many ways, education is more important to the federal government for its value in implementing other national and international goals than it is as a goal itself.
- Of the three partners, the federal government is farthest removed from the classroom where teaching and learning occur. It is least able to recognize and provide specifically for the educational needs of different communities, of different schools, and of different children.

With the recent expansion of federal activities in education, it is important at this time to examine the role of the federal government in financing elementary and secondary schools and the federal programs for implementing that role. Three basic questions must be asked concerning each existing or proposed federal program:

1. Is the *purpose* worthy and appropriate to the federal government?
2. Is the method *effective* for accomplishing the purpose?
3. Is the *design* of the program conducive to sound local-state-federal relationships?

For most federal programs, the purpose is examined extensively in Congressional hearings and public debate. But the method and design often receive very little attention. Public attention usually focuses on questions of the worthiness of the purpose of a new program rather than upon the questions of the effectiveness of the method or of the contribution of the program to sound intergovernmental relationships.

Legally, control of education is vested in the states and delegated by them to local school authorities. The federal government has no direct control of state and local school systems, but the threat of federal control is emerging with the growing number of special grant programs which employ a fiscal mechanism of control and administration. In the absence of a broad federal program to support elementary and secondary education, the proliferation of these special grant programs with project proposals, matching funds, and other specific requirements are fragmenting and weakening state and local control of education.

This statement sets forth criteria for the review of existing and proposed federal grant programs for public schools. The criteria are based on a point of view which balances (a) the need for general aid to education and, in some cases, for special aids, and (b) the need to preserve state and local control of education. The criteria are as follows:

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* Report of the Joint Task Force on Federal Support, NEA Legislative Commission and Committee on Educational Finance. Erick L. Lindman, Chairman.

1. The major contribution of the federal government to the partnership should be made through a basic financial program of support to the states. General aid for elementary and secondary education should be available to all pupils and programs as determined by local and state plans for improving educational opportunity.

2. The federal share of fiscal support of elementary and secondary schools when combined with state and local tax resources should be sufficient to provide adequate educational services and facilities in all state-local school systems.

3. The amount of aid should be generally predictable for long-range planning and specifically predictable for year-to-year planning. School programs require planning and sufficient time to recruit personnel and obtain facilities and equipment. If the partnership is to function efficiently, it is necessary for local boards of education to know at budget-making time the amount of federal funds they will receive during the ensuing year.

4. The amounts of federal funds to which individual states or local school districts are entitled should be determined by objective formulas, reducing to a minimum the discretionary power of federal officials. The formula for distributing federal funds should recognize the wide variation in the states' ability to finance education.

5. Federal funds for education should be allocated to state governments to be distributed by them to local schools in accordance with state plans. This general method of administering federal funds for education permits the state to play its crucial and appropriate role in the coordination of federal and state programs.

6. The accounting and auditing safeguards for federal grant funds should be applied at the state level by utilizing the procedures required by the states to safeguard state grants to local school systems. Separate accounting and auditing procedures for federal funds should not be superimposed on state requirements for local funds.

7. Special purpose grants appropriately supplement general purpose grants to stimulate the development of educational programs of critical national concern; to finance the research, development, and demonstration phases of special educational problems; or to meet the federal government's obligation as a landowner and employer for payments in lieu of local property taxes. Special grants should be limited in number and should comprise a small portion of the total federal aid. All special grant distributions should be reviewed by the Congress periodically, and the funds should be transferred to the general purpose grant funds when the specified purpose of the grant has been accomplished.

8. All federal educational programs should be administered by the U. S. Office of Education at the federal level, by the state educational agency at the state level, and by the local educational agency at the local level. Interests of other federal agencies in educational programs, in the field of health, welfare, labor, and others should be coordinated by the U. S. Office of Education.

The Role of the State in Equalizing Educational Opportunity—An ACIR Legislative Proposal

John Shannon

DRAFTING STATE foundation legislation is both a mysterious and a complicated subject; yet generalists often rush in where specialists fear to tread. Fortunately, our staff (Advisory Commission on Intergovernmental Relations) had the expert assistance of Dr. Eugene McLoone who helped translate our idealistic objectives into equalization concepts and legislative prose.

Before describing the provisions of the Advisory Commission's proposed legislation,[1] it might be appropriate to give you some information about the Commission and its interest in state legislation to equalize educational opportunity. The Advisory Commission is a permanent bipartisan body of 26 members that represents all levels of government. Congress created this agency in 1959 and instructed it to give continuing study to the needs of our federal system.

The Need for State Equalization Action

In 1965, the Advisory Commission took a close look at the economic and social disparities among local jurisdictions within metropolitan areas and quickly concluded that state governments will have to play a far more active role in equalizing educational opportunity. The Commission noted that equality of educational opportunity is of critical importance in a democratic society dedicated to the proposition that all persons should have an equal chance to develop their potentialities to the fullest. This objective takes on particular urgency as technological advancement causes employment opportunities to become progressively more limited to persons without professional and technical skills.

The Commission also observed that great disparities in educational opportunity will persist unless each state revamps its school grant formulas to (a) provide an adequate educational level below which no community may fall, (b) build in factors to measure as accurately as possible local tax effort and diverse community educational requirements, and (c) reflect such measurements in the allocation of aid.[2]

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[1] Reproduced at the end of this paper.

Dr. Shannon is Assistant Director, Advisory Commission on Intergovernmental Relations, Washington, D.C.

[2] Advisory Commission on Intergovernmental Relations. *Metropolitan Social and Economic Disparities: Implications for Intergovernmental Relations in Central Cities and Suburbs.* Washington, D. C.: Government Printing Office, January 1965. p. 125.

In order to hurry school equalization history along, the Commission has drafted model state legislation to facilitate legislative enactments of its recommendations. However, the Commission does not regard its model legislation as being as immutable as the laws of the Medes and Persians; rather, the draft legislation is merely something to shoot at. Your comments and suggestions will undoubtedly point up provisions that will need strengthening in future drafts of this legislation.

It must be admitted that those who draft model equalization legislation have something in common with the race horse handicapper. To use the parlance of the race track, we dream of that day when all school districts will finish in a very fast dead heat. This utopian vision assumes, of course, that we can all agree on the standard for measuring performance and that we can control or compensate for the pace of each entry in a diverse field.

In the real world, there is something less than universal agreement about performance standards, and the race horse handicapper and the educational equalizer must employ very different means to achieve their financial equalization objectives. The handicapper attempts to equalize the race by imposing heavier burdens on the more fleet of hoof. School equalization advocates seek to narrow the gap between the rich and the poor school districts by providing greater financial spur to the poorer districts.

The Need for Local Innovation and Inter-District Competition

The race track analogy also highlights a second need: If we are to run a fast race, we must have the local pacemaker as well as the state equalizer. The interests of education appear to be best served by policies that accelerate the general pace of educational performance as well as by those that reduce the gap between the "have" and the "have not" school districts.

If we want to maximize the number of dollars committed for public education and the advantages that come from local innovation, there appears to be no substitute for a substantial degree of local financing with its attendant inter-district competition. While transferring all financing responsibilities to the state level would promote the cause of inter-district equalization, it would probably constrict the flow of resources into public education channels.

Two State Equalization Responsibilities

To harmonize the need for inter-district equalization and competition, state policy should have for its central aim the creation of a financial environment that gives all local school districts at least a fighting chance to provide a first-rate brand of education. Specifically, every school district can become a competitor, if not a pacemaker, provided the state is willing to take on two distinct equalization responsibilities:

1. *Revenue equalization responsibility*—Give all districts an equal opportunity to obtain financing by using state aid both to compensate for local property tax differentials and to insure equal access to federal aid funds.

2. *Expenditure equalization responsibility*—Compensate those local school districts that are burdened with a disproportionate number of high-cost pupils.

Revenue Equalization

On the revenue side of the school finance equation, the proposed legislation comes to grips with a primary cause for educational disparities: the

TABLE 1.—STATE AND LOCAL GOVERNMENT EXPENDITURE FOR EDUCATION (OTHER THAN HIGHER EDUCATION) BY SOURCE OF FINANCING, BY STATE, FISCAL 1942 AND 1965

Percentage distribution by level of government

Region and state	Federal aid		State funds[a]		Local funds[a]	
	1942	1965	1942	1965	1942[b]	1965
1	2	3	4	5	6	7
United States	5.8%[c]	4.3%	32.9%[c]	38.3%	61.3%[c]	57.5%
New England	4.7	4.3	10.6	22.8	84.8	73.0
Maine	5.8	7.1	22.3	29.3	71.9	63.6
New Hampshire	9.2	5.8	6.6	10.1	84.2	84.1
Vermont	3.5	4.2	24.6	28.3	71.9	67.5
Massachusetts	4.4	4.2	10.0	18.4	85.7	77.5
Rhode Island	2.2	6.3	9.4	32.2	88.4	61.5
Connecticut	4.9	2.9	7.1	27.4	88.0	69.7
Mideast	4.9	2.7	31.3	41.4	63.8	55.9
New York	3.8	1.8	38.9	49.2	57.3	49.0
New Jersey	3.0	2.1	22.3	15.5	75.0	81.4
Pennsylvania	7.5	3.0	25.4	41.8	67.1	55.2
Delaware	8.5	3.2	89.4	85.6	2.1	11.2
Maryland	6.6	6.1	21.3	35.1	72.1	58.7
District of Columbia	2.3	9.6	...	...	97.7	90.4
Great Lakes	4.7	2.9	28.2	28.2	67.1	68.9
Michigan	5.5	2.6	45.6	39.3	48.9	58.0
Ohio	4.4	3.5	39.2	19.2	56.3	77.3
Indiana	5.4	2.4	32.6	32.8	62.0	64.9
Illinois	3.9	2.9	11.1	26.3	85.0	70.8
Wisconsin	5.6	2.9	15.4	22.1	79.1	75.0
Plains	4.3	4.4	23.8	25.1	71.9	70.5
Minnesota	4.2	2.1	36.0	38.9	60.0	59.0
Iowa	2.8	3.3	2.0	14.7	95.0	82.0
Missouri	4.9	4.5	40.3	32.8	54.9	62.6
North Dakota	3.5	7.7	29.2	21.5	67.3	70.9
South Dakota	2.5	8.1	21.8	10.5	75.6	81.4
Nebraska	4.5	5.1	6.0	5.3	89.4	89.6
Kansas	6.8	5.3	17.9	19.3	75.3	75.4
Southeast	8.9	6.5	47.4	53.2	43.6	40.3
Virginia	7.7	7.3	34.4	32.4	57.9	60.0
West Virginia	6.7	7.6	50.0	47.9	43.3	44.6
Kentucky	8.0	8.2	36.0	50.9	55.9	40.9
Tennessee	6.7	6.2	34.9	50.0	58.4	43.8
North Carolina	6.6	6.1	77.0	62.3	16.4	31.6
South Carolina	8.5	6.9	48.7	57.0	42.7	36.2
Georgia	9.1	7.8	47.3	57.6	43.6	34.5
Florida	11.5	4.9	46.6	52.7	41.6	42.5
Alabama	11.8	5.4	42.1	60.5	46.1	34.0
Mississippi	15.3	7.3	35.2	58.0	49.4	34.6
Louisiana	8.8	3.7	53.9	67.2	37.3	29.0
Arkansas	11.9	11.4	49.0	39.3	39.2	49.3
Southwest	6.9	5.5	53.1	44.7	39.9	49.9
Oklahoma	6.2	8.3	62.2	37.3	31.6	54.4
Texas	6.5	3.7	54.7	45.6	38.8	50.7
New Mexico	14.6	9.0	64.0	68.4	21.3	22.6
Arizona	5.9	8.9	66.3	32.6	26.7	58.5
Rocky Mountain	6.8	5.7	21.8	31.0	71.4	63.3
Montana	4.1	4.8	24.0	27.7	71.9	67.5
Idaho	3.2	5.9	27.8	30.8	69.0	63.3
Wyoming	13.1	5.5	18.0	38.3	68.9	56.2
Colorado	7.5	6.3	9.9	20.2	82.5	73.5
Utah	16.7	5.2	28.3	52.2	55.0	42.6
Far West[c]	6.6	3.6	61.8	40.9	31.6	55.5
Washington	7.3	5.4	52.0	62.5	40.7	32.1
Oregon	16.0	2.5	0.5	26.9	84.0	70.6
Nevada	3.4	4.9	24.1	36.3	72.4	58.8
California	5.5	3.4	44.6	39.3	49.9	57.3
Alaska	18.7[d]	26.9	60.6[d]	61.2	20.7[d]	11.9
Hawaii	7.3[d]	11.7	75.2[d]	75.3	17.6[d]	13.0

Source:
Prepared by the staff of the Advisory Commission on Intergovernmental Relations, based on a variety of federal government sources.

[a] Net of federal aid and state-local transfers.

[b] Includes a minor percentage for local government expenditures for higher education in 20 states, plus larger amounts in 4 states (California, New York, Ohio, and Texas).

[c] Excluding Alaska and Hawaii. Includes approximately $100 million for training of defense workers.

[d] Based on 1937 data; 1942 not available.

unequal distribution of property tax resources among local districts. Two property tax equalization approaches are recommended:

1. *Equalization of local property tax resources*—The legislation would require each local district to impose an effective tax rate, a levy calculated to underwrite [50] percent of the cost of the basic or minimum educational program [$500 per pupil] in a district with an average property tax base. Because this tax effort formula would generate revenue in excess of the designated amount in the wealthier districts, this "tax surplus" would be earmarked for redistribution among the poor districts, first in the home county and then throughout the state.

2. *Variable state matching grants*—The legislation would equalize local school tax effort expended to finance a program above the basic or minimum level by matching local school dollars in an inverse proportion to the district's equalized assessed value per pupil.

Let me emphasize that this equalization plan would *not* superimpose a new state tax on property. The locally imposed school tax would remain, restructured, however, to insure that the property tax resources of the entire state are uniformly tapped in support of the minimum level of education. Actually, this plan would undoubtedly permit school tax reductions in many poorer districts now making an extraordinary tax effort. By the same token, it might well result in higher taxes in some wealthier districts.

Let me also emphasize that the suggested legislation does not undercut the opportunity for local innovation. Each school district, rich or poor, would be free and encouraged by the state's variable matching to impose a supplemental tax rate to finance a level of education beyond the mandated minimum level.

Because a state variable matching system would provide state dollars in an inverse relationship to the size of the district's tax base, a poor school district with only half the average equalized assessment per pupil would receive three state dollars for each local dollar raised to support a program above the mandated minimum level. Conversely, the wealthy district with twice the average tax base would have to raise three local dollars in order to obtain one state dollar. The so-called average district would be matched dollar for dollar up to twice the minimum level [$1,000 per pupil].[3]

The central aim of these two provisions is to eliminate the accidents of property tax geography. The quality of a child's education should not be dependent on the size of the local tax base.

While several states—New York, Rhode Island, and Wisconsin—have equalization formulas that provide state support above and beyond the ordinary foundation type, the differences in the sizes of the local tax bases are often too great to be equalized by variable state matching grants. State legislation, therefore, must go farther and muster property tax resources of the entire state in support of a minimum level of per-pupil expenditures. The combination of a local property tax redistribution formula and variable state matching grants will go a long way toward placing all local school districts on an equal property tax footing.

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[3] For a detailed description of the financing arrangements for the "basic program" and the "educational improvement program," see: Advisory Commission on Intergovernmental Relations. *1967 State Legislative Program of the Advisory Commission on Intergovernmental Relations.* Washington, D. C.: The Commission, September 1966. p. 233. (Also reproduced on pages 37-47.)

Because of the growing importance of federal grant programs, state policies must also be designed to give each school district an equal chance to obtain help from this revenue source. If the state fails to act, only those local districts with tax leeway are in a position to match federal grant dollars.

The proposed ACIR legislation provides state aid to the poor districts for the express purpose of permitting them to participate in federal aid programs deemed desirable by the state legislature. Section 10 would undo the perverse situation in some states where only the wealthiest districts are able to take advantage of federal aid provided for the express purpose of assisting the poor.

Equalizing Expenditure Demands

It is becoming increasingly necessary to look at the expenditure side of the school finance equation because of the uneven distribution of extra-cost pupils among school districts. This concern takes on special significance for central city and many rural school districts.

Typically, the children living in the slums and in depressed rural areas stand out as the groups of young people most handicapped by inadequate support for education. In striking contrast, children residing in local districts with strong tax bases are usually the beneficiaries of a superior educational environment, both in the home and in the school.

In order to compensate those school districts with a disproportionate number of high-cost pupils, the ACIR proposed legislation directs the head of the state educational agency to conduct a special count of high-cost pupils at the beginning of the school year. This census identifies pupils with special educational needs such as those from families with low incomes, the mentally and physically handicapped, the emotionally disturbed, and the gifted. The head of the state educational agency is then directed both to determine the cost of these special education needs and to build them into the state aid formula.

Placing an educational price tag on cultural deprivation and racial discrimination raises at least two questions: For the professional educator, what are appropriate yardsticks for measuring the educational performance and needs of deprived pupils? For suburbanites, what price apartheid?

If the states are to play an important role in governing and servicing an urban America, they must face up to these tough issues. The federal alternative is both apparent and real.

The Municipal Overburden Issue

At least on one score the ACIR equalization proposal has been criticized for not going far enough. Specifically the bill does not compensate city school districts faced with the "municipal overburden" problem.[4] Let me emphasize that we are keenly interested in any views you may have on this issue.

It is an encouraging sign of the times to have educational finance people insist on taking a comprehensive view of the financial needs of local governments and school districts.

An increasing number of mayors are advancing quite a different solution for the municipal overburden problem. They advocate that the state assume complete responsibility for financing education, thereby enabling the cities and counties to enjoy exclusive exploitation rights within the property tax preserve. If the experience of the last 25 years can serve as any guide, most state governments will be extremely loathe to buy this solution.[5]

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[4] Municipal overburden is heavy use of the property tax to finance urban services and welfare programs as well as education.

There is still a third approach to this issue—the taxpayer overburden approach recently taken by Wisconsin. The state legislature has taken the position that an elderly homeowner who is required to turn over more than 5 percent of his total household income to the property tax collector is carrying an extraordinary burden. The state, therefore, rebates to the homeowner the amount in excess of 5 percent. Note that the state, not the local governments, assumes the responsibility for providing this type of relief.

Educators concerned about tax overburden might well study this Wisconsin plan. We, the citizens of the wealthiest nation in the history of mankind, should not have to force elderly homeowners through the property tax wringer in order to finance the education of our youth.

Summary

The ACIR legislative proposal would have state governments assume far greater responsibility for equalizing educational opportunity than they have demonstrated up to this time. Specifically, it calls for a major departure from the status quo on both the revenue and expenditure fronts. It would give all districts an equal opportunity to obtain financing by using state aid and state equalization mandates both to compensate for local property tax differentials and to insure equal access to federal aid funds. On the expenditure side, it would compensate those local school districts that are burdened with a disproportionate number of high-cost pupils.

Once more to use the race track analogy, this equalization plan is designed to insure that all districts leave the starting gate at the same time. It is also designed to insure that those districts with a weak tax base or those carrying extremely heavy educational loads are not forced to make extraordinary tax effort in order to stay abreast of the pack. The community's commitment to education, not the size of its tax base, would determine its performance.

In view of the great fiscal disparities existing among local school districts, adoption of this equalization plan would cause quite a change. Yet, in our rapidly changing urban world, the alternative is far more revolutionary—a status quo policy.

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[5] The financing trends clearly indicate that most states are moving toward a more equal division of financial responsibility between state and local school districts (see the table).

FISCAL MEASURES FOR EQUALIZING EDUCATIONAL OPPORTUNITIES FOR ECONOMICALLY AND SOCIALLY DEPRIVED CHILDREN

Equality of education opportunity is of critical importance in a democratic society dedicated to the proposition that all persons should have an equal chance to develop their potentialities to the fullest. This objective takes on a particular urgency as technological advancement causes employment opportunities to become progressively more limited to persons with professional and technical skills.

The growth of national and state programs in education demonstrates increasing citizen recognition that (1) the vagaries of political boundaries, (2) the variations in local property tax bases, and (3) the unwillingness of local rate-making bodies to underwrite education are no longer acceptable reasons for wide differences in educational opportunity. At the state level, however, the assumption of responsibility for high quality education has thus far been hampered by a reluctance to marshall all the state's fiscal resources, including the local property tax, in support of a total state educational program. Intercommunity disparities in educational opportunity will persist until each state revamps its school grant formulas to: (a) provide an adequate educational level below which no community may fall, (b) build in factors designed to measure as accurately as possible local tax effort and diverse community educational requirements, and (c) reflect such measurements in the allocation of aid.

Provision for state leadership in promoting equal educational opportunity in this suggested legislation proceeds from the premise that all tax resources within the state boundaries must be harnessed in support of a total educational program for all pupils in public schools regardless of where in the state they reside. State and local resources are joined in a four-phase plan to accomplish this purpose. The legislation provides:

1. A "basic program" at an adequate expenditure level [$500 per pupil] financed jointly at the state and the county level. Funds would come from the levy of a required countywide property tax rate based on equalized assessed value and from state appropriations in inverse proportion to each county's relative ability to support the basic program (sections 3 through 6 of the suggested legislation).

2. An "educational improvement program" in which states and localities participate in accordance with each local community's relative need for state aid to supplement the basic program in order to raise expenditures per pupil up to a maximum of twice the basic program level [$1,000 per pupil]. The objective of this program is to encourage all districts, but particularly the less prosperous districts, to go beyond the basic program level by matching their local effort with state funds on terms most favorable

for those districts with least local ability (sections 7 and 8 of the suggested legislation).

3. A "special needs program" to identify those segments of the state's pupil population necessitating extraordinary costs over and above those required for the average pupil and to provide funds to meet such special requirements until such time as they become integral parts of the regular school program. (Section 9 of the suggested legislation).

4. A "state program" to provide funds to districts for federal programs requiring local matching contributions or local outlays that will be federally reimbursed. The objective is to give all school districts equal access to federal aid that is now expanding into an ever increasing variety of programs, regardless of local ability to meet the matching or funding requirements. (Sections 10 and 11 of the suggested legislation).

For most states this plan, if enacted, would change the method of channeling state aid to local school districts. Continuing state responsibility to support local expenditures for education would be emphasized, not only at the minimum level, but well above it to achieve equality of educational opportunity. This contrasts sharply with the typical foundation-type program now widely used by states in which state basic school grants in conjunction with other state aid generally results in a uniform amount of assistance per pupil regardless of the wealth of the community or its special educational needs.

The "basic school program" gathers the property tax resources of the entire state in support of a mandated minimum level of per pupil expenditures in local districts. This eliminates the highly questionable practice of fiscal zoning to either (1) shield certain properties from the burdens of financing education or (2) reduce the cost of operating public schools in particular districts. The basic program requires that property throughout the state contribute equally to the basic school program through a state-mandated local property tax rate levied in each county and that collections in excess of local needs be transferred to the state for redistribution to less wealthy counties. Variations in the property tax base are submerged for purposes of this program in the interest of obtaining equal distribution of the property tax resource behind each pupil.

The "educational improvement program" enables school districts with the help of the state to improve their educational offering up to a maximum of two times the expenditures per pupil required for the basic program. A minimum guaranteed state share in local programs of educational improvement is provided even in the wealthiest districts.

The "special needs program" is the mechanism for bringing state and local tax resources to bear on the problems stemming from an uneven distribution of extra-cost pupils among school districts. The special school census called for in this legislation would identify unique needs district by district. State assistance would then be made available for high-cost educational needs either temporarily or in a manner that would build the necessary support into the basic program in school districts where extraordinary costs are permanent in nature. The special needs program has particular applicability to programs for overcoming the deterrent effect of poverty and cultural deprivation on the learning process. Typically, the children living in the slums of central cities and in depressed rural areas stand out as the groups of young people most handicapped by an inadequate support for education. Children residing in school districts with strong tax bases usually are the beneficiaries of a superior educational environment both in the home and in the school.

The "state program" of financial assistance to districts for federal aid purposes is provided to insure that the least wealthy school districts obtain the necessary funds initially required to participate in federal matching or reimbursement programs deemed desirable by the state legislature. This program would undo the perverse situation in some states where only the wealthiest districts are able to take advantage of federal aid provided for the explicit purpose of assisting the poor.

In combination the four programs recognize the responsibility of the state in providing equality of education opportunity for all pupils regardless of the wealth of their district or the need for varying types of education.

Several states now utilize one or more of the concepts embodied in this suggested legislation. For example, New York, Rhode Island, and Wisconsin have equalization formulae that provide state support above and beyond the ordinary foundation-type. Most states now require a minimum local tax effort under their foundation programs, but Utah is the only state that requires tax collections in excess of local needs to be turned over to the state for redistribution to the more needy districts. The present inadequacies of school aid legislation to achieve equal education opportunity on a statewide basis and the desirability of establishing a multi-faceted program with built-in flexibility to respond to emerging needs make suggested legislation along the lines presented here a timely subject for state consideration.

Suggested Legislation

[Title should conform to state requirements. The following is a suggestion: "An act to equalize educational opportunity."]

(Be it enacted, etc.)

Section 1. Statement of Purpose. The purpose of this act is to equalize educational opportunity in the public schools by requiring a minimum per pupil expenditure level, by encouraging local governments and boards of education to provide superior education beyond this minimum, by identifying fiscal responsibilities of local authorities, and by incorporating the several state aids into one comprehensive program.

Section 2. Definitions. As used herein:

(1) "Average daily membership" [or "average daily attendance"] means the average number of pupils in a school district during a school year as determined pursuant to the provisions of section 16 and the word "pupil" refers to pupil in average daily membership;

(2) "Equalized assessed valuation" means the equalized assessed valuation of taxable property for a school district as determined by the [state tax commission] pursuant to the provisions of section 15;[1]

(3) "Basic program" means the cost of education of resident pupils in grades preprimary through twelve in average daily membership for the reference year as determined by the mandated minimum program level;

(4) "Mandated minimum program level" means the amount which shall be spent by a school district for every pupil in average daily membership;

(5) "Required local property tax rate" means the countywide levy on the equalized assessed valuation required to finance the basic program;

(6) "Excess local property tax collections" means the amount of the required local property tax levy together with federal funds received under the federal program for maintenance and operation aid to federally impacted school districts (20 USCA 236-240) which exceeds the amount of funds required

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[1] In states where the equalized assessed valuation of taxable property by school district is not now available, a directive to the appropriate state tax authorities would need to be included.

in the county to finance the basic program;

(7) "Local percentage" means that percentage established by the legislature as the statewide local share of the basic program;

(8) "Reference year" means the school year immediately preceding that for which the aid is to be paid.

Section 3. Mandated Minimum Program. There is hereby established a mandated minimum program of education [$500][2] in the public schools of this state. The mandated minimum program level per pupil shall be financed from the levy of a required local property tax rate as provided in section 4 and from the state basic school fund provided in section 5.

Section 4. Required Local Property Tax Rate. Each county shall levy a local property tax for schools at the rate required to provide the local share of the basic program. The required local property tax rate shall be determined by dividing the product of the three following items: (1) local percentage [50%], (2) mandated minimum program level, and (3) the number of pupils in average daily membership in the state by the total equalized assessed valuation in the state.[3] Excess local property tax collections in any county shall be forwarded by the [county treasurer] to the [state treasurer] to be credited to the state basic school fund.

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[2] The amount of the mandated minimum program level for school districts should be substantially similar to the statewide median expenditure level per pupil in average daily membership and not the median expenditure level of school districts because it fails to reflect the higher cost of education generally required in large urban school districts. If some level below the median is selected, it would be well to specify it as "[   ] percent of the median."

[3] Because the local percentage and the mandated minimum program level together determine the required local rate, either the local percentage or the mandated level can be adjusted to produce a reasonable and acceptable rate. The calculation should result in a required local rate close to the rate levied in districts of average wealth or that levied by the majority of the districts. If the required local rate resulting from the calculation is too high, however, the local percentage rather than the mandated level of expenditures should be decreased. The following illustrates the computation required to determine the required local property tax rate:

Section 5. State Basic School Fund. There is hereby established the state basic school fund for the purpose of assisting all school districts to finance a minimum mandated level of per pupil expenditures. The fund shall consist of (1) excess local property tax collections and (2) state appropriations for this purpose.

Section 6. Determination of the State's Share of the Basic Program. The state's share of the basic program in each county shall be determined by subtracting from one hundred percent the local share which shall be the product of the local percentage times the ratio of equalized assessed value per pupil in the county to the statewide average equalized assessed valuation per pupil.[4]

Section 7. Educational Improvement Program. There is hereby established an educational improvement program in which the state will assist local school districts to finance a level of per pupil expenditures above the mandated minimum program level provided in section 3 up to 2.00 times that level or its equivalent, 2.00 times the basic program. The [head of the state education agency] shall subtract from total local expenditures approved by him for each school district, for purposes of this section, the amount of the basic program and the amount of federal funds received by the school district under the federal program for maintenance and operation aid to federally

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$$\frac{\begin{array}{c}[50\%]\\ \text{Local}\\ \text{Percentage}\end{array} \times \begin{array}{c}[\$500\text{ per pupil}]\\ \text{Mandated Minimum}\\ \text{Program Level}\end{array} \times \begin{array}{c}[200{,}000]\\ \text{Pupils in}\\ \text{ADM}\end{array}}{\begin{array}{c}\text{Equalized Assessed Valuation}\\ [\$5.\text{ Billion}]\end{array}} = \begin{array}{c}\text{Required}\\ \text{Local}\\ \text{Property}\\ \text{Tax Rate}\end{array} = \left[\begin{array}{c}\$1.00\text{ per}\\ \$100\text{ or }10\\ \text{mills per }\$1\\ \text{equalized}\\ \text{assessed value}\end{array}\right]$$

[4] The following illustrates the computation required to determine the state share of the mandated minimum program level for a county with equalized assessed valuation of half the statewide average:

$$100\% - \left[\begin{array}{c}\text{Local}\\ \text{Percentage}\\ [50\%]\end{array} \times \frac{\begin{array}{c}[\$1{,}250]\\ \text{Local Equalized}\\ \text{Assessed Value}\\ \text{Per Pupil}\end{array}}{\begin{array}{c}\text{Average Equalized}\\ \text{Assessed Value}\\ \text{Per Pupil}\\ [\$2{,}500]\end{array}}\right] = \begin{array}{c}\text{State Share}\\ \text{of Mandated}\\ \text{Program Level}\end{array} = [75]\%$$

impacted school districts (20 USCA 236-240) to determine the amount of state assistance under this section.

Section 8. Determination of the State's Share in Educational Improvement Program.[5] The state's share of the educational improvement program in each school district shall be determined by subtracting from one hundred percent the local share which shall be the product of the local percentage times the ratio of equalized assessed value per pupil in the school district to the statewide average equalized assed valuation per pupil provided however, that the state's share shall not be less than a guaranteed [10] percent in any qualified district. Districts which qualify for the educational improvement fund shall have more than [1200] pupils or local equalized assessed value per pupil less than [3.00] times the statewide equalized assessed value per pupil.

Section 9. Special Educational Needs Program. There is hereby established a special educational needs program to assist school districts in financing expenditures resulting from extraordinary educational costs. The [head of the state educational agency] shall conduct a special count at the beginning of the school year immediately following the effective date of this act to identify pupils with special educational needs such as those from families with low incomes, the mentally and physically handicapped, the emotionally disturbed, the gifted, and others. The [head of the state educational agency] shall determine the amount per pupil in excess of the mandated minimum program level that educational programs to serve the special needs of such pupils would require. The [head of the state educational agency] shall determine the distribution of these financial requirements and others such as above-average cost for pupil transportation among school districts. Upon the determination of the [head of the state educational agency] that groups of pupils or combinations of groups of pupils, identified by the special count, require per pupil expenditures in excess of the mandated minimum level and that such program expenditures raise per pupil costs more than [10] percent in any school district, he shall recommend either:

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[5] In the case of countywide school systems, this section is unnecessary as the calculation would be the same as section 6 except for the provision of a guaranteed [10] percent.

(1) that for the purposes of computing the state's share of the mandated minimum program level under sections 3 through 6 and the educational improvement program under sections 7 and 8 such pupils be weighted in the count of average daily membership by the relationship of their cost per pupil to the mandated minimum program level if the condition is believed to be one which will persist, or

(2) that an amount per pupil equal to the average amount of the excess cost above the mandated minimum program be paid all school districts with such pupils if such condition is temporary.[6]

Section 10. State Assistance for Matching Federal Aid. There is hereby established a state program to assist school districts with equalized assessed values per pupil less than the statewide average value per pupil to participate in the following federal programs requiring local funds:

[To be specified by the legislature from among programs as the National Defense Education Act, School Lunch Program, etc.]

Section 11. Determination of the State's Share for Matching Federal Programs. The state's share shall be that percentage required to make the federal matching funds together with state funds under this section equal to the state's share determined under section 8, the educational improvement program; except that, for the first year of this act, the state share shall be the matching funds required for participation in federal programs and the funds required to establish programs upon which federal funds are provided on a reimbursable basis.[7]

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[6] The basic program combined with the educational improvement program provides sufficient funds for both general and special needs when each school district has the same percentage of children with higher than average costs. Where there is great variation, however, sections 9 and 10 are desirable in order that a permanent need can be identified and made part of the basic program and temporary needs can be met. Continued study and review should provide the basis for changes in the basic program and recognition of new needs as they arise.

Section 12. *Collection of Required Local Property Tax Levy*. The [county treasurer] in each county shall receive the tax payments resulting from the levy of the required local property tax rate under section 4 and shall distribute as provided in section 13 such funds, together with state funds, to be distributed to the county under sections 5 and 6 of this act.

Section 13. *State Payments to Counties*. The [head of the state education agency] shall distribute to the [county treasurer] in each county from the state basic school fund the state's share which shall be the difference between the amount of the basic program and the sum of the amount of the coutywide required property tax levy plus the amount of federal funds received by or on behalf of school districts in the county under provisions of the federal program for maintenance and operation aid to federally impacted school districts (20 USCA 236-240). The [head of the state educational agency] shall certify to each [county treasurer] for each school district in the county the average daily membership as determined under section 16 and the amount of federal impacted area aid. The [county treasurer] shall distribute to each school district on the basis of the certification from the [head of the state educational agency] the amount of the difference between the basic program in the school district and the amount the school district received in federal impacted area aid under provisions of federal law (20 USCA 236-240). [Each state will need to determine the best schedule of cash flow to counties and to local school districts.]

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[7] This section makes it possible for districts of average and below average taxable property to participate on a par with more wealthy districts in federal programs. The first year provision is necessary to achieve this equity and the provision for continued state sharing in the same proportion provided under the educational improvement fund assures that the equity will be maintained. A similar first year provision would be needed to make all districts equal when future federal programs have matching or reimbursement provisions.

Section 14. State payments to School Districts. The [head of the state education agency] shall distribute as a combined payment to each school district the funds to be made available to the district from legislative appropriations for purposes of the educational improvement program under section 7, the special needs program under section 9, and the federal matching program under section 10 based on the state share determined under sections 8, 9, and 11.[8]

Section 15. Determination of Equalized Assessed Valuation. On or before August 1 each year the [state tax commission] shall determine and certify to the [state education agency] the equalized assessed valuation for each school district in the following manner: The total assessed valuations of real and tangible personal property for each school district as of [the assessment date] of the second preceding calendar year shall be weighted by bringing such valuations to the true and market value thereof which shall be the equalized assessed valuation of each school district. The sum of the equalized assessed valuations of real and tangible personal property for all school districts in a county shall be the equalized assessed valuation of the county and the sum of the total true and market value of real and tangible personal property of each county shall be the equalized assessed valuation of the state.

Section 16. Determination of Average Daily Membership. The [head of the state education agency] shall determine from data supplied by the [local education agency] in each school district the average daily membership of each school district for the reference year which shall be the aggregate number of days of membership of all pupils enrolled in grades preprimary to twelve (12), both inclusive, increased by (i) the aggregate number of days of membership of resident pupils whose tuition is paid by the school district to schools approved by the [state education agency] and decreased by (ii) the aggregate number of days of membership of nonresident pupils enrolled in its schools.[9]

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[8] In the event that legislative appropriations are insufficient to finance total program costs, provision should be made to prorate state shares in accordance with legislative determination of the priority of each program established by this act.

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[9] This section is somewhat over simplified on the assumption that the proportions of elementary and secondary pupils will be nearly equal in all school districts. Pupils have not been assigned weights although in Illinois and California where some separate elementary and secondary school districts exist weighting may be necessary. The effect of counting all pupils alike is not serious when state assistance is available for all local expenditures in excess of the mandated minimum level as provided in section 8. Moreover, the suggested legislation provides for special needs in section 9 which would be, in any district, a disproportionate number of higher cost secondary pupils.

Financial Management of Institutions of Higher Education

Irvin K. French

THE PROBLEM of financing higher education is not new. In 1930 when I entered the field of college business management, the balancing of a budget was of concern even as it is now and as it will be increasingly so in the years ahead.

The availability of endowment income does not appear to be the whole answer. Harvard, with its endowment of around $1 billion, is continually seeking more funds as are those institutions with little, if any, endowment. Fund-raising programs are being expanded; the paths to foundations, from the steps of those who are continually knocking at their doors, are becoming worn; alumni, corporations, and in fact all those who are reasonably well-heeled are being pressured as never before to contribute to some or many institutions. Now there remains little, if any, stigma to borrowing heavily for plant expansion. Annual or biennial tuition increases represent normal operating procedures.

Other signs of the times are becoming apparent. Vassar College recently announced that it was investigating the possibility of some kind of relationship with Yale, perhaps even going so far as to move the college to New Haven. The University of Buffalo, long a private university, just a few years ago became a part of the State University of New York system. Others could also be mentioned.

Private higher education is facing new challenges from the rapid expansion of state universities and colleges with their substantially lower tuition charges. And let us not forget the community colleges. For example, New York State is planning to have before too long a community college within commuting distance of every family in the state. These plans are already reflected in its Master Plan for Higher Education in New York.

Where new construction in private colleges is now usually financed by borrowing, the expansion of state systems, including community colleges, is more often financed from public funds. Debt service for the private segment of higher education becomes an increasing burden and siphons off funds that might otherwise contribute to urgently needed current operating funds.

The word *innovation* has become common in recent years. It may well express the efforts of many to survive or to maintain their position as quality

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institutions. Certainly the practices of the past 50 years are not those that will provide the answers to survival. Hence, wise and intelligent innovation may well be the answer.

These introductory comments are not intended to form the foundation for a pessimistic presentation. Rather, they are to emphasize the serious problems facing private higher education today and the need for searching for ways and means to resolve them.

To assist in identifying special problem areas that I would like to review briefly with you, the following comments are offered.

Faculty Salaries

In the AAUP study of faculty salaries, as reported in June 1966,[1] out of 55 private colleges in New York State, only 15 reported average salaries, exclusive of staff benefits, of over $10,000; 26 institutions reported average salaries under $9,000.

A review of the faculty mix of these as well as publicly supported institutions revealed that the medians of the percentages of faculty having each rank were as follows:

Professors	22.2%
Associate professors	24.3
Assistant professors	33.2
Instructors	18.9

Many of the foregoing institutions had a heavy concentration of their faculty in the two lower academic ranks, some of them reporting as high as 73 percent at the instructor and assistant levels.

This poses a serious question, whether higher education institutions can furnish quality instruction with a heavy concentration of faculty in these two lower ranks. From the information given it is difficult to determine if this situation is due to a shortage of operating funds or to some other cause. Perhaps the highly qualified faculty as represented in the two upper ranks are more interested in being associated with an institution with greater opportunity for research than is available in many of the small institutions.

The maintaining of faculty salaries at a competitive level represents a most serious problem and could well have an important bearing on the future of many institutions.

Tuition

The general trend in tuition charges in private colleges appears to be increasing at the rate of about $100 per year. In Catholic institutions this is from $70 to $80 per year.

Some years ago I attended a meeting of representatives from several private colleges in New England. At this meeting representatives of Harvard predicted that their tuition would increase at the rate of $100 per year. Their subsequent experience has borne out this prediction.

How much higher can tuition go and still make it financially feasible for students to attend private institutions? It will not be uncommon within the next few years to see the total tuition, and board and room charges amounting to $3,500 to $4,000 per year. Many are already there. I feel for the family with three youngsters, all of college age, who must face this problem.

With tuition at many of the publicly supported institutions in the neighborhood of $400 to $700 per year, it is only natural that many young people, in planning for their education, will look to the public institution even though their first preference might well be the private institution.

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[1] American Association of University Professors. "The Economic Status of the Profession: Report on the Self-Grading Compensation Survey, 1965-66." *AAUP Bulletin* 52:141-95; June 1966.

Certainly this whole question of rapidly increasing costs will have a definite bearing on the number of young people who will be seeking entrance to the private institution.

Enrollment Projections

A study now being conducted for our office is finding that many of the private colleges in New York State, both inadequately and well-financed, are showing a decrease in enrollments as well as in the number of applications. This is particularly true for commuting students.

An examination of the administration staffing pattern in many of these institutions shows the admissions office to be understaffed. This raises the question, Is it not poor planning and administration to expect to maintain a reasonable flow of applications without increasing the staffs, efforts, and budgets of these admissions offices?

One of the important decisions, with serious implications, is that of pegging enrollments at a particular figure. Recently I talked with college administrators who speak of achieving an enrollment of 700, 1,000, or 1,500 or more students and say that when these objectives have been reached, they do not plan to increase further. I question seriously the adoption of this approach, since, if the aims are achieved, future increases in operating costs must be borne largely by the then existing enrollments. Hence, instead of a tuition increase of approximately $100 per year, this could well result in upward adjustments of as much as $150 to $200 per year.

Use of Funds

The financial operations of numerous institutions during the past years, show a general pattern of allocation of expenditures among the major categories of educational and general costs. On the assumption that the primary purpose of an educational institution is to teach, the most effective use of funds is achieved where a maximum amount can be channeled into teaching costs. Hence, reasonable increases in enrollments will result in better management of the funds by providing for a larger share of these costs to be devoted to teaching.

It is seldom that the same percentage for administration, including that of financing the president, the deans, and the business offices will continue regardless of the size of the student body. The leverage of size can reduce the per-student cost of administration and, in some instances, other educational and general costs of an institution, thus helping to make it possible to finance a more attractive faculty salary schedule.

Any institution that says it can hold its enrollment at a given figure may be making a most serious mistake.

Debt Service

A recent development in college financing is the debt service that must be financed, and all too often, out of current operating funds. Not too long ago, new buildings were financed through gifts or fund drives. Today the common practice is to borrow from state, federal, or other sources, with resulting debt service of approximately $60 to $70 per thousand, running from 30 to 40 years. This charge has priority in the expense budget of an institution, and failure to pay these debt service charges could result in foreclosure. So far, the record has been good. However, the question will no doubt be raised very shortly as to the amount of debt service a college can afford while still maintaining adequate programs in other areas. Of two institutions with not too large enrollments, one has debt service charges of approximately $2,500,000 per year; the other has approximately $1,500,000. I would judge that this debt service is being financed to some degree by members of the staff who must accept lower than going salary rates in order to provide funds for these purposes.

Retirement Plans

All too many institutions now have inadequate plans for retirement. The old 5-5 basis is rapidly becoming a thing of the past, but still there are many institutions that are not making the necessary adjustments to finance an adequate retirement program. This may well be one of the reasons why some of these institutions often have difficulty in attracting quality faculty.

Up to now we have discussed some important decisions facing higher education institutions and implications of decisions that now, or in the very near future, must be made. Certainly, the educational complex is not going to fold. Solutions to problems are going to be found, and in some instances, by methods that do not currently appear on the surface.

There are, however, some steps that can be considered that may enable many institutions to face the future with more confidence than they now have. Some of these that will be mentioned may not, at this time, appear to be practical, yet already there are signs that they are receiving consideration which may later lead to their implementation. I shall mention some of them here.

1. *Satellites to major institutions*—Already there are signs indicating that this approach is being considered in many sections of the country. This approach may appeal more to the seminaries and small sister-formation colleges. Discussions now taking place in many of these institutions concern the possibility of association with a larger university. In these instances, a house of studies would be maintained by the particular order where religious instruction would be given, with other academic programs furnished by the institution with which they are associated. This has already been accomplished in some areas. It is quite likely that this practice will spread.

2. *Inter-institutional cooperation*—To enrich their academic programs, many institutions have developed cooperative arrangements whereby the particular strengths of one are shared by the other. This may be accomplished through formal or informal relationships. These arrangements can be found in the Midwest, the Great Lakes Area, New York State, California, Virginia, and other areas. Expansion of offerings can be worked out to the advantage of both institutions and students.

While many lasting benefits result from academic cooperation, success in fiscal, fund-raising, admissions, development, plant operations, and business cooperative arrangements has been achieved. However, in my judgment, the surface has hardly been scratched. If an honest desire to cooperate were to exist over the coming years, much greater financial returns from this cooperative approach will be seen as well as an improvement in management techniques through the exchange of ideas and methods of operation. The economic pressures are bound to influence the establishment and development of these practices.

3. *Year-round operation*—The implications of this type of program are

tremendous, at least from a financial point of view. For years it has been the custom of most colleges to operate nine months out of the year, leaving an expensive and valuable plant standing practically idle for three months during the summer.

The success of this movement might rest, in large part, upon a change in the graduation cycle of our secondary schools so that there will be a pool of students available to fit into a year-round program. Many of the costs of operation would not increase proportionately if a college were to operate during the summer. Admittedly, problems might result in securing sufficient faculty members to carry on a program of this nature. Also, there could well be difficulties in properly maintaining educational plants.

On the other hand, the example of Parsons College in year-round operation is a dramatic one; and what one institution can do, others can do if they so desire. I predict that in the years to come, year-round operation will become common-place in spite of some unfortunate experiences.

4. *Increases in student-faculty ratios*—Since the major cost of operating an educational institution is concentrated in faculty salaries, anything that can be done to increase the funds for this purpose without diluting the academic quality of the program deserves consideration.

To accomplish an upward adjustment in the student-faculty ratio is not a simple matter. Many factors must be taken into account before such changes are made. However, if increases in this ratio can take place, they would provide substantial amounts of money that could be applied toward faculty salary increases, as many administrators are already finding out. It does not necessarily mean that faculty members must teach more hours, for class size and course offerings have an important bearing on this.

This change is not a simple one to achieve, yet many institutions are now seriously considering this possibility, with resulting financial benefits where sound plans have become implemented.

5. *Educational aids*—Much has been mentioned in recent years regarding the use of teaching machines, educational television, etc. The wild excitement over teaching machines, when they first came on the market, seems to have been dissipated during the past few years. On the other hand, educational television is rapidly being expanded, and many plans are under way across the country to make better and more effective use of this exciting medium. New York State is moving ahead rapidly in this area. Other states as well as the federal government and some foundations are showing new interest in this development.

6. *Development efforts*—Fund-raising efforts in many institutions will be accelerated and expanded during the coming years. The skilled and competent fund-raiser will come at an even higher premium than he does today. His term of service at an institution may well depend upon the success of his efforts. However, to supplement the tuition dollar with additional funds to cover operating costs, it is essential that institutions secure the best man possible to carry on its fund-raising program. This may mean that his salary will be completely out of line with those of other administrative persons, but if he does produce, whatever he receives in compensation will be a worthwhile expenditure.

7. *Streamlining organization*—To meet the challenge of the years ahead, enlightened and qualified leadership will be required. The day of the gen-

eralist in college administration is a thing of the past. Every segment of a college's administrative program demands the best in administrative and management practices, and this can be accomplished only by building up the level of administrative competence.

8. *Cost consciousness*—In years past and even today there has been all too often a casual approach taken to cost factors in the administration of an institution. A greater knowledge of the operating costs of every phase of operation is becoming more and more essential. The advent of computers in many colleges today is providing the means for developing cost data necessary for control purposes. As much as we would like to say that colleges are different and are not subject to the same controls as a profit-making organization, the fact still remains that a cost-control program must be developed and refined to provide adequate financial and other data for administrative decisions. In the fight for survival, the dollar sign must take its proper place in the administration processes.

9. *Absorption by state institutions*—The financial support received by publicly controlled institutions is resulting in comparatively low costs for the student who decides to attend one of them. The increasing costs of tuition in private institutions and the growing number of state institutions and community colleges, along with the respectability they are achieving, have made the education obtainable through them more and more attractive. Already there are indications that private colleges are finding it extremely difficult to reach or maintain their enrollment objectives. If this situation continues, some of the private institutions will find it necessary to seek affiliation with the public institution. In New York State we already have the example of the University of Buffalo being absorbed into the State University system. The private colleges may not like it, but in the years to come it is quite likely that more and more of them will find it necessary to work out an arrangement of this kind.

Another example is the University of Pittsburgh which has recently gone largely public. Not too long ago the University of Vermont converted from a semi-private college into a fully recognized state institution.

Support for Higher Education

One of the major developments I see in the years ahead is increasing support for the private segment of higher education from federal and state sources. Already there are signs that this is being given consideration. Just what restrictions will be put on the use of these funds is difficult to judge.

For instance, in New York State about $79,000,000 of aid in one form or another is being furnished students who attend institutions, both public and private. This has resulted in a conservation of funds normally provided by a college from its own resources for these purposes.

If there is to be a proper balance between public and private education, it may well mean that tax monies from all the people must be shared by these two groups on some equitable basis.

Conclusion

Survival of private higher education will not be easy. Changes must continue to take place. New ideas and concepts must be carefully analyzed and in many instances implemented. You are facing an exciting and changing future. May you have the wisdom, judgment, skills, money, and courage to carry you forward.

The Economic Status of the Professor

William S. Graybeal

TRADITIONALLY the faculty in higher education has performed at least three important functions: interpret and advance the horizons of knowledge, transmit "information" to students and associates, and contribute to the development of the character, skills, and understanding needed for constructive participation in the affairs of mankind. The Educational Policies Commission of the National Education Association stated in 1957 that "the faculty group is a rich resource for the nation, significant to the preservation, extension, dissemination, and application of the accumulated reservoir of human knowledge."[1] The recruitment and retention of a competent and responsible faculty requires that employment in higher education be made economically attractive to the most capable persons in our society.

The seventh biennial survey of salaries in higher education conducted by the NEA Research Division reported that the median salaries paid in the 1965-66 session were as follows: $9,081 in colleges and universities which grant the 4-year or higher degree; $8,361 in public 2-year colleges; and $6,407 in nonpublic 2-year colleges. Interpretation of the economic status reflected in these median salaries must be based on the quantity and quality of the economic rewards of other occupations in our society.

Recognizing the essential need for maintaining high quality in the staffing of higher education institutions, two groups have suggested guidelines which may be useful in evaluating the economic status of the professor. First, the Ford Foundation suggested in a 1962 report on the Foundation grants for college teacher salaries that in 1955, low financial reward was a major problem in staffing higher education institutions and that

> higher education could win a larger share of the nation's best talent only by adjusting its salaries to a more competitive position in the nation's professional market place. College teaching would have to be viewed in relation to other professions—medicine, law, engineering, business management—that were competing for the best people and that required comparable preparation.[2]

Second, guidelines for reviewing the economic status of the professor were suggested by a report of the Presi-

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[1] National Education Association and American Association of School Administrators, Educational Policies Commission. *Higher Education in a Decade of Decision.* Washington, D.C.: the Association, 1957. p. 79.

[2] Ford Foundation. *The Pay of Professors.* A Report on the Ford Foundation Grants for College-Teacher Salaries. New York: the Foundation, February 1962. p. 3.

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dent's Commission on Higher Education in 1947. Elements which the Commission reported to be basic to a sound salary policy for colleges and universities included:

- The beginning salary should be sufficiently high to meet competition and to attract outstanding talent.
- There should be early increases in salary sufficient to hold excellent teachers and research specialists.
- The salary schedule should provide for reasonable increases in salary, based upon satisfactory performance, within each category of rank.
- The typical salary should provide for the maintenance of reasonable living standards and should reflect recognition of the individual's worth to society.
- Salary policies in individual institutions should be determined with the participation of faculty representatives.[3]

Ruml and Tickton reported that during the half century between 1904 and 1953

> relatively, salaries in the field of education rose less than salaries in other occupations and industries, with the result that the economic position of people in education has deteriorated over the years, after allowing for income and social security taxes and changes in the cost of living.[4]

Tickton reported in 1959 that this trend of deterioration had been stopped; that between 1953 and 1959 the growth in the purchasing power of salaries in education was about the same as in industry.[5] The trend data in the present study begin in 1959.

Limitations of Data

Several conditions limit the accuracy of information which may be used to evaluate the economic status of the professor. A major deficiency is attributable to the difficulty in deriving an estimate of the annual earnings. The major national surveys deal with contractual salaries for the academic year with longer contracts reduced to an academic-year equivalent (AAUP and NEA Research Division), or with salaries for these two groups of contractual periods reported separately (USOE).

Two national surveys of faculty in higher education conducted by the U. S. Office of Education provide an estimate of the extent that the academic-year equivalent salaries are underestimating the annual contractual salaries of faculty in higher education. Wright and Dunham[6] reported that the proportion of faculty employed on academic-year contracts in 4-year colleges and universities was 64 percent of all faculty reporting and that the median annual contractual salary of those employed for the calendar year was 23 percent greater than the median of those employed with academic-year contracts. The D'Amico study[7] observed that academic-year contracts were reported for 85 percent of the faculty in 4-year colleges and universities and for 89 percent of the faculty in 2-year institutions. The mean salary of those employed for 11- or 12-month contracts was 20 percent greater than the mean of those employed for an academic year in the 4-year colleges and universities, and the difference was 3.5 percent in the 2-year colleges. Differences in the samplings of these two studies may account for part of the difference in the estimated extent of summer employment.

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[3] President's Commission on Higher Education. *Higher Education for American Democracy.* Volume IV. Staffing Higher Education. Washington, D.C.: the Commission, December 1947. p. 53 and 54.

[4] Ruml, Beardsley, and Tickton, Sidney G. *Teaching Salaries Then and Now.* Bulletin No. 1. New York: Fund for the Advancement of Education, 1955. p. 31.

[5] Tickton, Sidney G. *Teaching Salaries—Then and Now—A Second Look.* New York: Fund for the Advancement of Education, May 1961. 45 p.

[6] Dunham, Ralph E., and Wright, Patricia S. *Preliminary Report on Teaching Faculty in Higher Education, 1962-63: Primary Teaching Areas and Contract Salaries.* U. S. Department of Health, Education, and Welfare, Office of Education, Circular No. 733. Washington, D. C.: Government Printing Office, 1964. p. 8.

[7] D'Amico, Louis A. *Higher Education Salaries, 1963-64.* U. S. Department of Health, Education, and Welfare, Office of Education, Circular No. 759. Washington, D. C.: Government Printing Office, 1965. p. 28 and 59.

Many faculty members are employed by a separate contract to teach in their institutions during the summer session. Among the 1,017 bachelor's or higher degree-granting colleges and universities responding to the 1965-66 NEA Research Division survey of salaries, 863 institutions reported that they offered summer programs, and 631 reported that they employ some of their regular-year faculty in the summer session. The median percent of regular faculty employed for the session was 41.3. Almost half of these institutions paid the same rate for summer-school employment as employment in the regular session; only 6 percent paid more than in the regular session. Among the 401 public 2-year colleges responding, 311 indicated they operated a summer session; the median percent of regular faculty given this added employment was 32.[*]

Academic-year salaries in higher education have been compared with annual earnings of other professions in several studies which have evaluated the economic status of the professor. The rationale for this practice is the importance of this "unemployed" portion of the 12-month year in which the professor performs or prepares to perform the multiple expectations which he and his institution assign to the position of faculty in higher education. These activities include review, research, reflection, observation, and study which contribute to increasing competence and effectiveness of the professor during the regular academic year. While this assumption is not universally practiced in higher education (summer teaching opportunities described above), many institutions which allow summer teaching employment expect that such employment for an individual will not occur every year.

The higher education salary information obtained in the NEA Research Division surveys does not include provision for adding the estimated value of economic fringe benefits. This limitation also applies to salary and earnings information about persons in other professions (where fringe benefits probably exceed those in higher education). The economic value of fringe benefits is included in the annual surveys conduced by the AAUP, and in 1964-65 this amounted to 7.5 percent of the average salary and to 8.1 percent of the average in 1965-66.

Comparisons based on indicators of economic status must be treated in very general terms owing to differences among the professions in the number of contractual days per year, length of the working day, provisions for vacations and various types of leaves with pay, personal responsibility for the expenses of professional growth, policies allowing outside employment, opportunities to develop personal income from writing and consultation as by-products of activities for which one is regularly employed, etc. Also, decisions based on a comparison of salaries in higher education with the earnings of self-employed persons in

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[*] National Education Association, Research Division. *Salaries in Higher Education, 1965-66.* Research Report 1966-R2. Washington, D. C.: the Association, February 1966. p. 28 and 29.

TABLE 1.—1965-66 ACADEMIC-YEAR SALARIES OF INSTRUCTORS AND ASSISTANT PROFESSORS AND AVERAGE BEGINNING ANNUAL SALARIES OFFERED IN JUNE 1965

Group	Salary
1	2
Colleges and universities, 1965–66 (4-year or higher degree-granting)	
Instructors, lowest quartile	$ 6,163
Instructors, median	6,761
Assistant professors, lowest quartile	7,658
Assistant professors, median	8,417
2-year colleges, 1965–66	
Public institutions, lowest quartile	7,097
Nonpublic institutions, lowest quartile	5,738
Average annual beginning salary offers to male master's degree candidates, 1964–65 (graduates of June 1965)	
Business administration, industrial management, or commerce	
After nontechnical undergraduate degree	8,100
After technical undergraduate degree	9,048
Engineering	
Chemical	9,108
Electrical	9,360
Mechanical	9,180
Sciences	
Chemistry	8,604
Mathematics	8,868
Physics	9,132
Average annual starting salaries paid to men graduates with master's degree in June 1965	
Engineering	9,024
Accounting	7,884
Sales-marketing	8,040
Business administration	8,256
Liberal arts	7,788
Production management	7,980
Chemistry	8,184
Mathematics-statistics	8,172
Economics-finance	8,376
Median annual starting salaries of inexperienced graduates in chemistry and chemical engineering, 1965	
Chemists, bachelor's degree	6,900
Chemists, master's degree	8,004
Chemists, doctor's degree	11,700
Chemical engineers, bachelor's degree	7,680
Chemical engineers, master's degree	9,000
Chemical engineers, doctor's degree	12,300

Sources:
National Education Association, Research Division. *Salaries in Higher Education, 1965-66.* Research Report 1966-R2. Washington, D.C.: the Association, February 1966. p. 19, 31, 34, 35.
College Placement Council. *Salary Survey, A Study of 1964-65 Beginning Offers.* Bethlehem, Pa.: the Council, 1965. Monthly amounts converted to annual salaries by the NEA Research Division.
Endicott, Frank S. *Trends in Employment of College and University Graduates in Business and Industry, Twentieth Annual Report.* Evanston, Ill.: the Author (Director of Placement, Northwestern University), December 1965. Annual salaries computed by the NEA Research Division from monthly figures given in the Endicott Report.
Chemical and Engineering News, October 18, 1965. Washington, D.C.: American Chemical Society. Data originally appeared as monthly salaries; converted to annual salaries by the NEA Research Division.

comparable professions should allow for the differences in the individual's responsibility for providing the basic tools of the profession being practiced.

The institutions of higher education are widely different in resources, objectives, expectations of faculty personnel, programs, and economic status. A general conclusion about the economic status of the professor would not be applicable to all types of institutions in all parts of the nation.

The earnings of personnel in most professions are reported on the basis of a calendar year. For some comparisons in this report an estimate of the calendar-year earnings of higher education faculty has been prepared by using parts of two academic sessions. These are necessarily very general estimates owing to the limited accuracy of the estimated proportions of each academic year to be included in a given calendar year.

That information about earnings during recent years is not available for many professions should be considered in estimating the relative economic status of the professor. All professions for which recent salary or income data are available have been included here.

Criterion I:

Attraction of Outstanding Talent

The first criterion suggested by the Educational Policies Commission is that the salaries be sufficiently competitive that higher education will attract persons having outstanding ability. Summarized in Table 1 are the first quartile and median 1965-66 salaries paid to persons in the lower two ranks of faculty in 4-year degree-granting institutions and all faculty in the 2-year colleges, and the beginning salaries offered to June 1965 graduates in several fields.

Beginning faculty in bachelor's or higher degree-granting colleges and universities tend to be employed in either of the two lower ranks depending upon the level of their preparation and the type of institution. A sample survey of these faculty during session 1964-65 conducted by the NEA Research Division found the following characteristics of experience and academic preparation:

Characteristic	*Instructors*	*Assistant professors*
Mean years of experience	5.9	8.0
Mean years of experience in present institution	4.8	5.9
Percent having bachelor's degree as highest earned degree . .	16.0%	3.5%
Percent having master's degree as highest earned degree	69.2%	53.8%
Percent having doctor's degree as highest earned degree	11.6%	39.4%

The mean levels of experience indicate that the faculty beginning their career in higher education are only a part of the total group of persons in these lower two ranks. Therefore, the lower quartile salaries of faculty in these ranks are likely to most nearly represent the beginning salaries of inexperienced new faculty personnel. Also the relatively small proportion of faculty in these ranks who report having the bachelor's as highest earned degree suggests that comparison with other occupations should be directed to persons having a master's or higher degree.

The salary information in Table 1 shows that the average and median salaries offered outside higher education to men graduating with the master's degree in June 1965 exceed the lowest quartile of salaries among assistant professors, the median salary of instructors, and the median salary of 2-year college faculty for the 1965-66 academic year. The means of annual salary offers to men having the master's degree in engineering and in the sciences exceed the median of annual salaries paid to ALL assistant professors in 1965-66. This summary of

TABLE 2.—SCHEDULED MINIMUM ACADEMIC-YEAR 1965-66 SALARIES IN HIGHER EDUCATION INSTITUTIONS AND IN PUBLIC SCHOOLS

Group	Number of institutions or systems responding to survey	Number of salary schedules included in this summary [a]	Scheduled minimum salaries: Low	Scheduled minimum salaries: Median	Scheduled minimum salaries: High
1	2	3	4	5	6
COLLEGES AND UNIVERSITIES					
Public					
Instructors	353	194	$4,000	$5,940	$7,900
Assistant professors	353	194	4,740	6,989	9,050
Nonpublic					
Instructors	664	273	3,000	5,631	8,000
Assistant professors	664	273	4,000	6,577	9,900
2-YEAR COLLEGES, PUBLIC					
Structured salaries by academic preparation					
Master's degree	257	182	4,500	6,012	7,670
Doctor's degree	257	156	5,100	7,185	9,980
Structured salaries, by rank					
Instructor	144	68	4,131	6,121	7,480
Assistant professor	144	69	4,500	7,013	8,500
PUBLIC SCHOOL SYSTEMS					
25,000 or more enrolled					
Master's degree	150	150	4,100	5,400	6,820
Doctor's degree or equivalent [b]	150	93	4,400	6,034	7,830
12,000 to 24,999 enrolled					
Master's degree	300	300	3,600	5,354	7,743
Doctor's degree or equivalent	300	152	4,194	5,962	8,611
6,000 to 11,999 enrolled					
Master's degree	621	621	3,600	5,400	7,715
Doctor's degree or equivalent	621	259	4,200	6,150	8,915

Sources:

National Education Association, Research Division. *Salary Schedules for Classroom Teachers, 1965-66.* Research Report 1965-R15. Washington, D.C.: the Association, October 1965. p. 14 and 16.

NEA Research Division files.

[a] Additional institutions reported having salary schedules which were not sent to the NEA Research Division or were sent and did not contain the provision described.

[b] Very few systems accepted an equivalent to the earned doctor's degree.

salary information suggests that when salaries are used as the sole criterion, higher education is not likely to attract and retain the best qualified persons.

Another approach to estimating the beginning salaries offered to persons considering entry into higher education is provided by a review of the scheduled minimum salaries. While institutions do not necessarily limit the beginning salary to the minimum salary scheduled, this may be the maximum amount to be offered to persons having minimum acceptable qualifications. The use of salary schedules in 1965-66 was reported by 56.6 percent of the responding 4-year colleges and universities, by 79.3 percent of the responding public 2-year colleges, and by 38.8 percent of the nonpublic 2-year colleges.

Table 2 shows the range and median of scheduled minimum salaries in the ranks or positions which may represent the normal entry level of master's and doctor's degree graduates when

TABLE 3.—FIELDS OF HIGHER EDUCATION IN WHICH CRITICAL SHORTAGES OF QUALIFIED TEACHERS ARE MOST FREQUENTLY REPORTED AND THE PERCENTS OF DOCTOR'S DEGREE GRADUATES ENTERING HIGHER EDUCATION TEACHING

Field	Number of institutions reporting critical shortage, 1963–1965			Percent of doctor's degree graduates of 1962–1964 in college teaching
	4-year	2-year	Total	
1	2	3	4	5
Mathematics	597	159	756	66.4%
Physics	406	132	538	28.7
Foreign languages	359	117	476	87.3
Economics	201	19	220	65.9
Chemistry	191	105	296	22.8
Psychology	175	32	207	37.2
Sociology	166	25	191	76.6
Biology	106	30	136	40.9
Business (other than accounting)	146	85	231	75.0
One or more fields	940	467	1,407	
Total institutions reporting	1,084	566	1,650	
All fields				48.4%

Source:
National Education Association, Research Division. *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1963–64 and 1964–65.* Washington, D.C.: the Association, 1965. p. 27, 45, and 55.

employed in higher education and in public-school teaching. The information about scheduled salaries in higher education does not represent all institutions which maintained salary schedules; a small number did not supply their salary schedule documents.

Comparison of the minimum scheduled salaries, with consideration given to the mixture of bachelor's, master's, and doctor's degree requirements for persons entering the rank of instructor, suggests that the initial economic reward offered to qualified teachers with a master's degree may be greater in 2-year colleges than at either higher or lower levels. However, inference about the national situation based on this observation is questionable if consideration is given to the possible influence of differences in the general income levels of the regions in which large numbers of the reporting institutions are situated.

The information in Table 2 also suggests that unless the beginning teacher with the doctor's degree is paid above the minimum or is given rank of assistant professor in the 4-year colleges and universities, it is likely that his beginning salary would be about the same at all three levels of education. Also, the minimum scheduled salary for teachers with the doctor's degree in a significant number of school systems is comparable with the minimum scheduled salaries for assistant professors in 4-year colleges and universities.

Comparison of the information in Table 2 with the beginning salaries offered outside higher education to graduates in June 1965 (Table 1) shows that if entering faculty are paid minimum scheduled salaries, higher education is not likely to attract the best qualified graduates. If the relationship between the levels of beginning salary offers to persons having the master's and those having the doctor's degree, as listed in Table 1, are applicable to other fields of preparation, the salaries in higher education are even less likely to attract highly qualified persons having the earned doctor's degree. The 1965 graduates in chemistry or chemical engineering having the doctor's degree were being offered median annual starting salaries of $11,700 and $12,300, respectively. The median salary of *all full professors* in 4-year colleges and universities in 1965-66 was $12,953; the median for *all associate professors* was $10,058.

Another general indicator of the economic attractiveness of teaching in higher education for graduates with the doctor's degree is provided by the biennial NEA Research Division study, *Teacher Supply and Demand in Colleges, Universities, and Junior Colleges, 1963-64 and 1964-65.*[9] This study observed that 48.4 percent of the doctor's degree graduates were employed in college and university teaching. Ideally this low entry rate might reflect a bountiful supply of qualified doctor's degree graduates applying for teaching positions with many of the less talented being turned away owing to limited openings in higher education. The existence of this condition is refuted by the information listed in Table 3. The fields most frequently reported as having a critical shortage of qualified teachers are shown together with the percent of doctor's degree graduates in these same fields who entered higher education teaching. Despite the critical shortage of qualified teachers,

TABLE 4.—MEDIAN ANNUAL SALARIES OF FACULTY IN 1963-64 AND 1965-66, ESTIMATED MEDIAN 1964 SALARY, AND PERCENT OF FACULTY WHO ARE WOMEN, BY TYPE AND SIZE OF INSTITUTION OF HIGHER EDUCATION

Type of institution	Median salary						Estimated median 1964 salary	Percent of 1965–66 faculty who are women
	1963–64			1965–66				
	Men	Women	Total	Men	Women	Total		
1	2	3	4	5	6	7	8	9
Public universities (by enrollment)								
10,000 or more	$9,179	$7,322	$8,931	$10,266	$8,195	$10,053	$9,118	13.4%
5,000 to 9,999	8,738	7,642	8,696	9,536	7,780	[illegible],321	8,800	16.9
Under 5,000	8,103	6,709	7,844	9,006	7,302	8,868	8,015	20.4
Nonpublic universities (by enrollment)								
5,000 or more	9,541	7,252	9,318	10,448	7,777	10,157	9,458	12.1
Under 5,000	8,509	6,701	8,257	9,692	7,661	9,412	8,450	13.1
State colleges	7,992	7,331	7,855	8,924	8,113	8,750	8,004	23.1
Nonpublic colleges (by enrollment)								
1,000 or more	7,670	6,653	7,475	8,439	7,174	8,214	7,598	19.8
500 to 999	7,101	6,069	6,808	7,764	6,800	7,480	6,920	27.1
Under 500	6,617	5,549	6,264	7,180	6,265	6,845	6,361	32.0
Total 4-year institutions	8,342	6,940	8,163	9,275	7,732	9,081	8,316	18.4
Public 2-year colleges	7,915	7,522	7,828	8,405	7,830	8,361	7,917	25.8
Nonpublic 2-year colleges	6,031	5,346	5,719	6,664	6,114	6,407	5,834	37.0

Source:
National Education Association, Research Division. *Salaries Paid and Salary Practices in Universities, Colleges, and Junior Colleges, 1963–64;* Research Report 1964–R3; and *Salaries in Higher Education, 1965–66.* Research Report 1966–R2. Washington, D.C.: the Association, February 1964 and March 1966.

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[9] National Education Association, Research Division. *Teacher Supply and Demand in Universities, Colleges, and Junior Colleges, 1963-64 and 1964-65.* Research Report 1965-R4. Washington, D. C.: the Association, April 1965. 92 p.

TABLE 5.—DISTRIBUTION OF 1966 SALARIES OF SCIENTISTS AND OF THE 1965-66 SALARIES IN HIGHER EDUCATION

	Distribution of salaries				
	Lowest decile	Lowest quartile	Median	Highest quartile	Highest decile
1	2	3	4	5	6
Scientists in 1966 (full-time employed, civilian)	$7,700	$9,300	$12,000	$15,200	$19,700
Scientists employed in educational institutions (academic year)	...	...	9,600	...	...
Faculty in higher education, 1965–66					
4-year institutions	6,524	7,604	9,081	11,204	13,920
Public 2-year institutions	6,223	7,097	8,361	10,090	11,455
Nonpublic 2-year institutions	5,077	5,738	6,407	7,336	8,391

Sources:

National Science Foundation. *Salaries and Selected Characteristics of U.S. Scientists, 1966.* Reviews of Data on Science Resources, No. 11. Washington, D.C.: Government Printing Office, December 1966.

National Education Association, Research Division. "Salaries in Higher Education Continue to Grow." *NEA Research Bulletin* 44: 50–57; May 1966.

higher education was not attracting as many as half of the doctor's degree graduates in physics, chemistry, psychology, and biology.

Criterion II:

Salaries of the Profession

A fundamental criterion for evaluating the general adequacy of faculty salaries in higher education is provided by the suggestion of the President's Commission that the typical salary allow reasonable living standards and reflect the individual's worth to society. Table 4 shows the median annual salaries paid in the 4-year colleges and universities, and 2-year colleges in session 1963-64 and in 1965-66. The information for 1965-66 was reported by 1,570 of 2,031 institutions (4-year or higher degree-granting) invited to participate. Responses were received from about 90 percent of public colleges and universities, about 80 percent of nonpublic universities and large nonpublic colleges, about 75 percent of the medium size nonpublic colleges, and 56 percent of the small nonpublic colleges. Included are responses from 84 percent of the public 2-year colleges and 64 percent of the nonpublic 2-year colleges. The response rates in the various types of institutions were not widely different in the 1963-64 survey.

The U. S. Department of Commerce, Bureau of the Census, has estimated the following median earnings in 1964 of year-round full-time employed civilian workers 14 years old and over in the professional, technical, and kindred occupations:

Occupation group	*Median 1964 annual earnings* [10]	
	Men	*Women*
Professional, technical, and kindred workers	$ 8,543	$5,132
Self-employed	13,257	. . .
Salaried	8,262	5,126
Engineers, technical	10,467	. . .
Teachers, elementary and secondary schools	6,677	. . .
Other salaried workers	7,746	5,455

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[10] U. S. Department of Commerce, Bureau of the Census. *Income of Families and Persons in the United States.* Current Population Reports, Consumer Income Series, P-60, No. 47. Washington, D. C.: Government Printing Office, September 24, 1965. The base figures shown were prepared by inflating weighted sample results to agree with independent estimates of the populations based on statistics updated from the 1960 Census. Median earnings not shown where base is less than 200,000 workers.

An estimate of the median 1964 calendar-year salaries of higher education faculty was obtained by adding one-sixth of the two-year growth of median salary to the median 1963-64 academic-year salary (the last three months of 1964 being one-third of the 1964-65 session, or one-sixth of the total growth in salary from 1963-64 to 1965-66). The median 1964 estimated salary resulting from this procedure was $8,316 in 4-year colleges and universities, $7,917 in public 2-year colleges, and $5,834 in nonpublic 2-year colleges.

These estimated median 1964 salaries in higher education are lower than the estimated median annual 1964 earnings of men professional, technical, and kindred workers. The median salaries of faculty in 4-year colleges and universities are slightly higher than the median of salaried men professional, technical, and kindred workers. However, the educational requirements, cost outlay for preparation, loss of earnings during that preparation, and societal expectations of many occupations in the larger grouping are not comparable with those in higher education.

The relative economic status of faculty in higher education was not the same among the various types of institutions. The information in Table 4 shows that the median salaries paid in the large universities are above the median of all professional, technical, and kindred workers; however, even among these institutions the median salaries are much lower than those reported by self-employed men professional, technical, and kindred workers.

Women in higher education seem to have attained economic status comparable to women in the total grouping of professional, technical, and kindred workers, but their median salary or economic status is lower than that of men in the same groups of higher education institutions. The groups of institutions having highest proportions of faculty who are women have the lowest median salaries for men faculty.

A distribution of the 1966 salaries of scientists in the National Register is provided by the National Science Foundation survey: *Salaries and Selected Characteristics of U. S. Scientists, 1966.*[11] The survey covered 242,763 scientists having the following characteristics:

- 92 percent were men
- 37 percent had the doctor's as highest degree; 27 percent had the master's as highest degree
- 87 percent were employed full time
- 36 percent were employed in educational institutions; 34 percent were employed in industry and business
- 18 percent had teaching as a primary work activity.

The distributions of salaries among these scientists in 1966 and the 1965-66 academic-year faculty salaries in higher education are shown in Table 5. The time periods do not coincide, but overlap by about two-thirds. The median 1966 annual salary of the scientists is greater than the highest quartile of 1965-66 faculty salaries in 4-year colleges and universities, and greater than the highest decile of salaries paid to faculty in the 2-year colleges. The median annual salary of the scientists in a similar survey in 1964 was $11,000, a level reached in 1965-66 by only the highest quartile of 4-year college and university faculty.

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[11] National Science Foundation. *Salaries and Selected Characteristics of U. S. Scientists, 1966.* Review of Data on Science Resources, No. 11. Washington, D. C.: Government Printing Office, December 1966. 8 p.

An estimate of the economic status of the general level and distribution of salaries for the faculty in higher education is provided by the summary in Table 6. Again, the periods of employment overlap. If adjustment were estimated to equate the effect of the time difference, the salaries of the nonteaching professions would need to be increased by an amount almost equal to the normal growth of salary levels in one year.

The requirements for entry among listed professions are not entirely comparable. Also, these professions may differ in their importance to society. However, the distributions show that salary levels in higher education need to be improved, and that continued effort is needed to extend upper-level salaries to more persons achieving the highest levels of academic status in higher education.

A second part of the criterion for evaluating the current status of the total pattern of higher-education salaries is provided by the suggestions that there be (a) early increases in salary sufficient to hold excellent faculty, and (b) reasonable increases in salary within each rank, based upon satisfactory performance. These suggestions, in part, were directed to the need for increasing within institutions the range of salaries paid to persons achieving the upper levels of experience and rank.

The NEA Research Division sampling study of higher education faculty provides an estimate that in 1964-65 the mean amount of experience in higher education among full professors was 20.8 years. It may be assumed that many of these professors received their doctor's degree after entering faculty status; 81.5 percent reported having the doctorate as their highest earned degree. An estimate of the relative economic status of the persons at these upper levels of experience and rank may be derived by comparing the median 1965-66 salary of full professors with the median 1965 salary of professional scientists engaged in research and development and having 10 and 15 years' experience since attaining the doctor's degree. Information from the National Survey of Professional Scientific Salaries shows the following average annual 1965 salaries for scientists in nonsupervisory positions having

TABLE 6.—ANNUAL EARNINGS OF PROFESSIONAL PERSONNEL IN FIVE OCCUPATION GROUPS AND IN HIGHER EDUCATION

Group and year	Percent of group having salaries in interval					
	$8,099 or less	$8,100 to 10,449	$10,500 to 13,199	$13,200 to 15,599	$15,600 or greater	Total
1	2	3	4	5	6	7
Attorneys, 1964–65	7.8%	19.0%	19.7%	16.8%	36.7%	100.0%
Chemists, 1964–65	21.7	29.2	25.0	13.8	10.3	100.0
Engineers, 1964–65	8.9	34.2	31.5	14.2	11.2	100.0
Faculty, 4-year institutions, 1965–66	32.7	36.2	18.2	7.7	5.2	100.0
Faculty, 2-year institutions, 1965–66	45.1	34.3	19.8	0.8		100.0
Accountants, 1964–65	43.8	39.1	14.2	2.4	0.5	100.0
Auditors, 1964–65	37.7	42.1	17.6	2.3	0.3	100.0

Sources:
New York State Teachers Association. *Basic Economic Statistics for Teachers*. Albany, New York: the Association, October, 1966. Table B–4 which summarizes information derived from U.S. Department of Labor, National Survey of Professional, Administrative, Technical, and Clerical Pay, February–March 1965. Bulletin No. 1469, 1965. *Salaries of higher education faculty* are interpolated from data reported in: National Education Association, Research Division. *Salaries in Higher Educaton, 1965–66. Washington, D.C.: the Association, 1966.*

the indicated numbers of years since earning the doctor's degree: [12]

Years since earning doctor's degree	1965 average salary
10 years	$13,812
15 years	15,492
17 years	16,044
18 or more years	16,656[13]

These average annual 1965 salaries are considerably higher than the $12,953 median salary of full professors of the 4-year colleges and universities in 1965-66. Also, only 20.2 percent of the full professors that session were paid annual salaries of $15,500 or higher (the average 1965 salary among scientists having 15 years since completing the doctor's degree).

Among associate professors in 1964-65 the mean experience in higher education was 12.8 years; 64.2 percent had the earned doctor's degree and only 1.5 percent had the bachelor's as the highest earned degree. The median salary in 1965-66 of the associate professors was $10,058. The average salaries of professional scientists engaged in research and development work in 1965 and having 10 years' experience since obtaining the bachelor's or master's degree was $12,324; among those having five years' experience since obtaining the doctor's degree, the average salary was $12,312. These average salary levels are about 20 percent greater than the median salaries of the associate professors. Not more than 12 percent of associate professors were paid 1965-66 salaries of $12,000 or higher.

Trend in the Economic Status of the Professor

Recognition of the inappropriately low economic status of the professor during the mid-1950's led to the establishment of recommended growth patterns of higher education salaries for the subsequent decade. The Educational Policies Commission concluded in its 1957 report, *Higher Education in a Decade of Decision:*

> An average annual increase of 5 to 10 percent in terms of stable dollars between now and 1970—with major emphasis on more than average increases during the early years of the period—is a conservative estimate of what is necessary to attract into teaching a reasonable proportion of the available qualified personnel.[14]

Also, the 1957 report of the President's Committee on Education Beyond the High School recommended that for higher education salaries "the goal be set at no less than double the present average level on an overall national basis within five to ten years, although . . . there are and will be substantial differences by region and institution." [15]

The median salaries of faculty in the institutions reporting in the recent biennial salary surveys conducted by the NEA Research Division are listed in Table 7. Subsequent to the base year of 1957-58 the biennial increases in median faculty salaries have not approached a minimum average compound rate of increase of about 7.2 percent, the growth needed to double the average salaries in 10 years. The 1965-66 median salary in 4-year colleges and universities is only 51 percent

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[12] Los Alamos Scientific Laboratory of the University of California, Wage and Salary Department. *National Survey of Professional Scientific Salaries.* Los Alamos, N. Mex.: the Laboratory, October 1965. Annual salaries computed by NEA Research Division from monthly data reported.

[13] Estimated by the NEA Research Division.

[14] National Education Association and American Association of School Administrators, Educational Policies Commission, *Higher Education in a Decade of Decision.* Washington, D. C.: the Association, 1957. p. 131.

[15] President's Committee on Education Beyond the High School. *Second Report to the President.* Washington, D. C.: the Committee, 1957. p. 36.

TABLE 7.—MEDIAN SALARIES OF FACULTY IN HIGHER EDUCATION AND PERCENTS OF INCREASE, BIENNIALLY SINCE 1955-56

	4-year colleges and universities				Public 2-year colleges				Nonpublic 2-year colleges			
Session	Percent of institutions responding	Faculty	Median salary	Percent increase from 2 years before	Percent of institutions responding	Faculty	Median salary	Percent increase from 2 years before	Percent of institutions responding	Faculty	Median salary	Percent increase from 2 years before
1	2	3	4	5	6	7	8	9	10	11	12	13
1955-56..........	71.9%	78,613	$5,243	. . .	60.6%	6,328	$5,470	. . .	34.0%	1,295	$3,613	. . .
1957-58..........	76.9	90,276	6,015	14.7%	76.2	8,038	6,261	14.5%	45.1	1,254	4,016	11.2%
1959-60..........	87.7	107,887	6,711	11.6	87.2	9,680	6,578	5.1	61.8	2,036	4,710	17.3
1961-62..........	73.6	115,090	7,486	11.5	79.4	12,037	7,212	9.6	58.0	2,559	5,074	7.7
1963-64..........	77.1	135,476	8,163	9.0	77.9	15,003	7,828	8.5	55.0	2,634	5,719	12.7
1965-66..........	77.5	158,052	9.081	11.2	83.7	22,166	8,361	6.8	63.6	2,971	6,407	12.0

Source:
NEA Research Division reports on salaries in higher education.

TABLE 8.—PERCENTAGE CHANGE IN LEVEL OF ESTIMATED AVERAGE ANNUAL STARTING SALARIES PAID TO MEN GRADUATES BETWEEN 1965 AND PRELIMINARY ESTIMATES FOR 1967

Occupation	Average annual starting salaries		Percent change, 1965 to 1967 (est.) (2-year period)
	1965	1967 [a]	
1	2	3	4
JUNE GRADUATES WITH BACHELOR'S DEGREES			
Engineering	$7,584	$8,544	12.6%
Accounting	6,732	7,344	9.1
Sales-Marketing	6,276	6,996	11.5
General Business Administration	6,240	6,864	10.0
JUNE GRADUATES WITH MASTER'S DEGREES			
Engineering	9,024	10,020	11.0
Accounting	7,884	8,832	12.0
Sales-Marketing	8,040	9,276	15.4
Business Administration	8,256	9,024	9.3
Liberal Arts	7,788	8,376	7.6
Production Management	7,980	9,276	16.2
Chemistry	8,184	9,408	15.0
Physics	8,808	9,540	8.3
Mathematics-Statistics	8,172	9,288	13.7
Economics-Finance	8,376	9,180	9.6
Other	8,340	9,120	9.4

Source:
Information based on reports by: Endicott, Frank S. *Trends in Employment of College and University Graduates in Business and Industry*. Evanston, Ill.: the Author (Director of Placement, Northwestern University).
[a] Estimates of starting salaries made in November 1966 to men who will graduate in June 1967.

greater than in 1957-58. Progress has been slightly greater among the reporting nonpublic 2-year colleges than in other groups of institutions; however, the impact of rapidly enlarging faculty is not as great in these institutions as in other colleges and universities. Also, greater growth must be expected—the levels of median salaries in the nonpublic 2-year colleges have been considerably lower than in the other types of institutions.

The pattern of growth in median salaries suggests that the salaries in higher education in 1967-68 will not approach the level which the President's Committee suggested as a minimum goal needed for giving appropriate economic status to the professor.

A summary of the annual salaries being offered to June graduates in 1965 and 1967, shown in Table 8, indicates that unless greater growth of salaries is realized, the institutions of higher education will not be able to improve their relative position in the market for graduates having highest qualifications. The 2-year percents of increase range from 7.6 percent to 16.2 percent with a median of 11.0 percent for graduates having a master's degree. The percent increase in median salaries between 1963-64 and 1965-66 was 11.2 percent in the 4-year institutions, 6.8 percent in the public 2-year colleges and 12.0 percent in the nonpublic 2-year colleges.

An indication of whether the increasing numbers of graduates of colleges, universities, and graduate schools will reduce the competition to higher education in attracting highly qualified manpower is provided by information collected in two surveys of employment offers to graduates. Endicott reports that the number of inexperienced bachelor's and master's degree men graduates expected to be employed by 182 reporting companies in 1967 each represents 53 percent more than the number of men employed by these same companies in 1966.[16] The College Placement Council reported that in December 1966 "overall, the volume of offers to doctoral candidates is almost double that of a year ago, while the master's volume is up 16 percent." [17]

The information reviewed in the present study supports a hypothesis that the economic status of the professor is below desirable levels. Improvement in this status will be required if higher education is to maintain and improve the quality of its faculty.

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[16] Endicott, Frank S. *Trends in Employment of College and University Graduates in Business and Industry.* Twenty-First Annual Report. Evanston, Ill.: the Author (Director of Placement, Northwestern University), December 1966. p. 3.

[17] College Placement Council. *Salary Survey. A Study of 1966-67 Beginning Offers.* Bethlehem, Pa.: the Council, January 1967. p. 1.

The Educational Dimension of Large City School Finances in Their Metropolitan Context: A Comparative Analysis

Seymour Sacks

THE EDUCATIONAL and fiscal dimensions of large city school finances have undergone considerable change since World War II. In addition, since the latter part of the 1950's the position of large city school systems has changed relative to the nation as a whole and to the metropolitan areas of which they are part. Prior to the 1950's they occupied a position of leadership in their expenditures and in availability of resources; now the leadership in expenditures per pupil has been wrested away by the suburbs, and their resource position has been severely debilitated. The crisis in central city school finances is not a figment of the imagination, but a situation which must be dealt with, not only in its state and national context but in its metropolitan context as well.

The purpose of this paper is to analyze one dimension of the large city school finance problem, the educational dimension, in the context which appears to be clearly the most relevant today. The problem is not only to look at large cities as most earlier analyses have done, but also to look at the metropolitan context of school finances. The educational dimension considered in this paper, while related to and determined in large measure by fiscal considerations, is not a measure of the fiscal dimension of education. The fiscal dimension refers to the resource use and resource availability relative to the entire community, while the educational dimension generally refers to the population being educated by public elementary and secondary schools. The major decisions concerning the kinds of problems and data were made with the fiscal dimension in mind, but the results reported in this analysis are mainly about the educational dimension.[1]

The paper is divided into three sections. The first section is devoted to an

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[1] The results of the combined analysis will be reported in a study entitled *The Allocation of Fiscal Resources to Large City School Districts,* to be published by the Syracuse University Press as part of a Carnegie Corporation-supported Education in Large Cities series now being completed at the Metropolitan Studies Center, Maxwell Graduate School, Syracuse University, by Seymour Sacks and David Ranney.

analysis of the meaning and measurement of the educational dimension of school finances. Alternative methods of measuring the educational dimension will be considered. However, since a major aim of the study of which this is a part is to integrate the educational and fiscal dimensions of school finance, the decision was made to use definitions for which compatible educational and fiscal data for entire metropolitan areas could be found. Thus, while the measure used bears the familiar name *current expenditures per pupil,* the information is drawn from fiscal sources and is at slight variance from those generally presented in educational sources.[2] This concept is close to the standard established in The Elementary and Secondary Education Act of 1965.[3] It is at this stage that the cost-quality relationship is referred to and some implications are considered.

The second section of this paper considers the factors which (a) determine the variations in the observed levels of current expenditures per pupil among large central city school systems, and (b) determine the variation in the observed levels of current expenditures per pupil among the areas outside the central city as well. The aim is to determine the nature and extent to which the factors that influence central city school systems differ from the factors influencing the areas outside the central city.

The third section considers the factors which influence the difference between the current expenditures per pupil of a given central city school system and the school systems which make up the remainder of the metropolitan area of which they are part.

I. The Educational Dimension of School Finances

The educational dimension of school finances is ordinarily measured by current expenditures on education divided by the number of pupils or other educational units served. The choice of measures depends on the purposes for which they are to be used. In this study expenditures made by the local school systems are considered, as well as current expenditures made in behalf of local elementary and secondary education by other local governments. Data problems exist for both dependent and independent school systems. The manner in which expenditures and enrollments are reported reflect individual state practices and rules. Thus, in Massachusetts it is difficult to extract data concerning interest payments because these are incorporated in a town general fund and the responsibility for a retirement system is assigned to the state government.

According to the U. S. Office of Education and the National Education Association, current expenditures are segregated into those which are for full-time elementary and secondary schools and those which are for other programs. The analysis of data made by Gerald Kahn in his study, *Current Expenditures per Pupil in Large Public School Systems, 1959-60,* may be quoted in full:

> In summary, data from the following accounts are considered to have a high degree of reliability: administration, instruction, pupil transportation, operation, and maintenance. (With regard to the latter two, this is true only for large systems, such as those covered in this study.) The accounts of fixed charges and attendance and health services are less reliable. In fixed charges, all or a sizable portion of teacher retirement may not be reported. In at-

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[2] For a detailed analysis see: Meranto, Philip. *The Politics of Federal Aid to Education in 1965.* Syracuse, N. Y.: Syracuse University Press, Spring 1967.

[3] See Sec. 203(a)(1) of the ESEA, 1965, for use of a comparable figure on a state level.

tendance and health services, health services to pupils provided by agencies other than the school system are often not reported, and attendance staff and supplies are frequently not separated from the administration or instruction accounts. (It should be noted that in this type of case, reporting attendance expenditures with those for administration or instruction will add relatively little, on a percentage basis, to these accounts and will not detract from their general validity.[4]

Cogent arguments based on fiscal considerations have been made for the exclusion of various current-expenditure categories, such as transportation and food services, but the absence of detailed data and the fact that comparable arguments might be made in the case of noneducational expenditures have jointly been responsible for the retention of the more extensive definition. A final advantage, the results are directly comparable to the national metropolitan and non-metropolitan totals reported in the 1957 and 1962 Censuses of Government and to those implicitly contained in the new series on selected metropolitan areas.

Just as there have been differences of opinion as to what should be included in the expenditure measure, there has been disagreement as to what is the correct unit for measuring "school load." There are two approaches: the first takes into account only the number of pupils, the second takes into account only divergent local system responsibilities. According to Kahn, "Average daily attendance (annual aggregate attendance divided by number of days taught) is the traditional, almost universally available, unit for measuring school load on a per-pupil basis." [5] This first approach measure, while available for the large school districts, states, and the United States, is not available for the remainder of the metropolitan areas. In addition to the ADA measure, there have been measures which have tried to take into account number of pupils on the live enrollment record. Average daily membership (ADM) provides such a measure. Further state data are not readily available and where available, not comparable.

The most comprehensive pupil data available, and the only data appropriate throughout the metropolitan context, are the enrollment data. While not as sophisticated as the ADA or ADM data, they have a substantive connection with the problem. The problems of attendance and weighting which characterize the second approach may be inserted as a separate variable if considered necessary. Annual data on enrollment are the most comprehensive educational load available, and the data are less subject, although not completely independent to, state practices. There are other data available, such as school-age population data, but they bear no direct relevance to the problem of public-school population when there are great variations in the proportion attending nonpublic schools.

The second approach tries to take into account divergent local school system responsibilities. These measures have often been associated with state support plans of general elementary- and secondary-school purposes. At the 1965 Conference of the NEA Committee on Educational Finance, Munse [6] discussed three weighting factors which dominate state foundation aid programs, individually or in combination with each other: pupil grade level, school or district size, and teacher training or experience. However, information on a consistent and comprehensive basis is definitely not available. As the relationship to state aid indicates, they are primarily fiscal variables and are best interpreted as such.

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[4] Kahn, Gerald. *Current Expenditures per Pupil in Large Public School Systems, 1959-60.* U. S. Department of Health, Education, and Welfare, Office of Education, Circular No. 677. Washington, D. C.: Government Printing Office, 1962. p. 6.

[5] *Ibid.*, p. 1.

[6] Munse, Albert R. "Weighting Factors in State Foundation Programs." *Trends in Financing Public Education.* Proceedings of the Eighth National Conference on School Finance. Washington, D. C.: National Education Association, 1965. p. 56-62.

Therefore, the measure most universally available for ascertaining the educational dimension of school finances in the large central cities and their outside areas are the current expenditures less capital outlays per pupil enrolled. Further, since enrollment data are available on a national basis for metropolitan and non-metropolitan areas, it is possible to make comparisons among and between central cities and the metropolitan area outside the central cities. Further, these data are consistent with the fiscal data. Finally, these can be viewed in the context of metropolitan, state, regional, or national norms.

The large cities herein considered are the 42 largest cities in 1960, exclusive of Washington, D. C., San Antonio, Phoenix, Oakland, and Fort Worth. The 37 central city and areas outside the central city were drawn from 35 SMSA's, and these were reconstituted by David Ranney [7] who used the central city school district as a basis. On the basis of internal checks and comparison with other studies, it appears that there is little change due to this treatment of the data on a school district basis, as opposed to a municipal basis.[8]

Before turning to the analysis of current expenditures per pupil in 1961-62, let us briefly look at the relationship between cost and quality. The search for a clear-cut link between cost and quality has been difficult. Some elements of current cost are not directly related to the quality of education; they may be designed to furnish transportation to provide greater choice, to overcome low densities, or they may provide community services, student body activities, classes for summer or adult education. In general, these expenditures are limited or are designed explicitly to overcome obstacles, i.e., not improve quality. In general, this type of expenditure has been growing in recent years. The same is true of retirement system costs, which have shown considerable growth, but only indirectly are reflected in better quality instruction. The restriction of instruction costs as a measure of quality may be too limited. Differences in administration or "auxiliary services" may indeed measure differences in the quality of education.

Apart from the differences in cost not associated with the quantity or quality of educational inputs, the effect of educational inputs, the effect of cost on quality has been limited. To quote Clark (as adapted by Burkhead):

> Large numbers of experiments have been conducted, some dating back to the 1890's, in an attempt to increase the efficiency of education and to establish a basis for judging its quality. All such studies show that school quality varies greatly among different communities. Variations will range from very small differences up to differences of two years or more.
>
> In many cases the differences in the quality of a school are due largely to factors in the community. If parents in one community are well educated, this will have a positive effect on the achievement of children in school. Other community factors, such as income and occupation, closely associated with the educational attainment of

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[7] These areas were chosen by David Ranney and are analyzed in his unpublished doctoral dissertation, *School Government and the Determinants of the Fiscal Support for Large City Education Systems,* Syracuse University, 1966.

[8] James, H. Thomas; Kelly, James A.; and Garms, Walter I. *Determinants of Educational Expenditures in Large Cities of the United States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 2389. Stanford, Calif.: Stanford University, School of Education, 1966. p. 100.

TABLE 1.—CURRENT EDUCATIONAL EXPENDITURES PER PUPIL, TOTAL EDUCATIONAL EXPENDITURES PER CAPITA, AND TOTAL NONAIDED EDUCATIONAL EXPENDITURES PER CAPITA (TAX PROXY) FOR CENTRAL CITY AND OUTSIDE AREAS, 1962

City	Current education expenditures per pupil		Total education expenditures per capita		Total non-aided education expenditures per capita	
	Central city	Outside area	Central city	Outside area	Central city	Outside area
1	2	3	4	5	6	7
New York	$536.88	$684.34	$ 77.29	$194.05	$47.10	$127.88
Chicago	408.51	473.69	66.09	112.60	50.78	92.15
Los Angeles	437.14	555.54	101.01	174.83	64.82	72.53
Philadelphia	397.75	492.96	54.69	105.59	37.24	81.42
Detroit	461.67	434.10	93.78	128.08	70.16	88.59
Baltimore	366.07	421.61	80.50	112.82	60.67	81.21
Houston	290.09	450.35	63.75	143.85	32.42	91.87
Cleveland	370.59	459.50	65.01	113.74	58.25	100.98
St. Louis	386.58	423.73	55.31	100.70	37.11	75.87
Milwaukee	377.90	469.38	65.20	124.75	51.77	112.84
San Francisco	466.77	546.29	69.19	172.17	45.47	73.83
Boston	385.46	465.36	50.32	100.87	43.78	93.09
Dallas	301.96	325.40	74.72	100.37	47.29	61.63
New Orleans	271.87	233.05	41.74	66.63	12.68	27.62
Pittsburgh	368.00	450.98	51.19	96.05	39.76	61.52
San Diego	414.63	538.95	105.13	156.29	67.70	92.42
Seattle	409.89	415.72	89.39	138.86	46.93	58.83
Buffalo	447.03	561.20	59.27	137.32	33.82	77.52
Cincinnati	373.11	577.74	62.80	118.29	55.07	95.24
Memphis	227.58	245.71	58.74	96.59	26.54	64.25
Denver	418.30	380.74	81.19	151.07	67.13	116.37
Atlanta	272.52	287.80	57.42	90.49	36.17	51.47
Minneapolis	414.31	441.45	61.42	157.05	41.91	63.32
Indianapolis	352.87	467.92	69.83	144.17	51.30	116.28
Kansas City	409.19	350.67	75.09	156.54	54.40	126.33
Columbus	327.40	332.06	61.25	98.08	51.97	69.77
Newark	496.21	522.23	93.80	112.08	78.32	100.04
Louisville	301.44	477.73	42.81	134.33	25.28	106.31
Portland (Oregon)	421.59	480.14	79.37	149.10	58.32	95.58
Long Beach	426.33	555.54	85.99	174.83	51.08	84.77
Birmingham	194.43	223.89	49.93	61.49	18.23	23.64
Oklahoma City	269.23	291.67	67.16	83.76	43.97	70.37
Rochester	580.05	573.07	79.35	158.58	54.79	91.53
Toledo	377.71	511.85	80.08	160.51	71.54	113.00
St. Paul	415.51	441.45	58.10	157.05	40.37	55.02
Norfolk	265.43	288.65	47.42	87.51	29.53	59.23
Omaha	282.58	394.90	49.48	136.83	43.88	126.37
Mean	376.33	438.38	68.69	126.17	47.23	83.80
Standard deviation	83.61	106.77	16.04	31.45	14.94	25.54
Coefficient of variation	22.1%	14.4%	23.4%	24.9%	31.6%	30.5%

Source:
Compiled from *Census of Governments, 1962,* U.S. Bureau of Census.

parents, are significantly correlated with pupil achievement.

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There are high expenditure schools that are good schools; there are high expenditure schools that are poor schools; there are some low expenditure schools that are extremely good. This highly confused situation is exactly what one would expect to find where there are a great many things that affect the quality of the school. Many of these influences are independent of each other, and many others are tied together in extremely subtle ways. It is not surprising that a number of factors that are associated with good schools tend to cluster together. Good teachers tend to be attracted to good schools. Good supervision, good administration, and high expenditure levels are associated with good schools. Strong community interest and good schools go together.

It would appear that perhaps one-third of the factors affecting the quality of the schools have some relationship to expenditure levels; but if all schools in the United States had the same expenditure level, there would still be enormous differences in the quality of education. In fact, there are some reasons to believe that quality differences

TABLE 2.—SIMPLE CORRELATIONS: PER-PUPIL CURRENT EXPENDITURES AND SELECTED INDEPENDENT VARIABLES

Item	United States [a]	New York State [b]	United States [c]	United States [d]	United States [e] Metropolitan Area		United States [f] Metropolitan Area	
1	2	3	4	5	6	7	8	9
Area covered	State	County	School districts	Large school districts	Central cities	Outside central city	Central city school	Outside central city districts
Year	1960	1965	1960	1960	1957	1957	1962	1962
Sample size	48	58	1127	107	36	36	37	37
VARIABLE								
Per-capita income	.859	.590	NA	NA	.491	.479	.529	.578
Median family income	NA	NA	.25	.553	.448	NA	.618	NA
Enrollment ratio	NA	−.120	NA	NA	−.717	−.340	−.528	−.394
Percent in private school	NA	NA	.25	.557	NA	NA	.439	NA
Aid per pupil	NA	−.480	NA	NA	.319	.204	.361	.447
Assessed property value per pupil	NA	NA	NA	.430	NA	NA	NA	NA
Equalized property value per pupil	NA	.811	NA	NA	NA	NA	NA	NA
Percent owner-occupied homes	NA	NA	NA	−.249	−.385	−.312	−.311	.208
Percent nonwhite population	NA	NA	−.24	−.411	−.484	−.537	−.449	NA
Median years of schooling of adult population	NA	NA	.17	.170	NA	NA	−.007	NA

Sources:

[a] From: R. Welch in: Sacks, Seymour. "Interstate Variations in Educational Expenditures." *Instructional Improvement Through Research, 1963-64.* Albany: State Education Department, 1965. p. 107.

[b] From: New York State Department of Audit and Control. *Financial Data for School Districts, Year Ending June 30, 1965.* Albany: the Department, 1966. p. 63.

[c] From: Miner, Jerry. *Social-Economic Factors in Spending for Public Education.* Syracuse, N. Y.: Syracuse University Press, 1963. 159 p.

[d] From: James, H. Thomas; Kelly, James A.; and Garms, Walter I. *Determinants of Educational Expenditures in Large Cities of the United States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 2389. Stanford, Calif.: Stanford University, School of Education, 1966. 198 p.

[e] Derived from: Campbell, Alan K., and Sacks, Seymour. *Metropolitan America: Fiscal Patterns and Governmental Systems.* New York: Free Press, 1967. Appendix B.

[f] From: Sacks, Seymour, and Ranney, David. *Allocation of Fiscal Resources to Large City School Districts.* (A study to be published by the Syracuse University Press.)

TABLE 3.—SIMPLE CORRELATION MATRIXES

(A) Large city school districts, 1962

INDEPENDENT VARIABLES	IC	ER	SA	CEPO	CEP	Mean	Standard deviation	Coefficient of variation
Per-capita income [a] (IC)	1.000	—.040	.384	.452	.529	$2068	$273	13.2%
Enrollment ratio [b] (ER)		1.000	—.091	—.488	.528	17.2%	3.2%	18.6%
State aid per pupil (SA)			1.000	.244	.361	$124.91	$52.54	42.1%
Per-pupil current expenditures outside central city (CEPO)				1.000	.702	$438.38	$106.77	24.4%
DEPENDENT VARIABLE								
Current expenditures per pupil (CEP)					1.000	$376.33	$83.61	22.2%

(B) Areas outside central city

Outside central cities	IC	ER	SA	CEP	CEPO			
INDEPENDENT VARIABLES								
Per-capita income (IC)	1.000	—.368	.070	.723	.678	$2182	$337	15.4%
Enrollment ratio (ER)		1.000	.128	—.201	—.394	22.6%	3.0%	13.3%
State aid per pupil (SA)			1.000	.468	.447	$165.48	$76.94	46.5%
Per-pupil current expenditures in central city (CEP)				1.000	.802	$376.33	$83.61	22.2%
DEPENDENT VARIABLE								
Current expenditures per pupil outside central city					1.000	$438.38	$106.77	24.4%

[a] Significant at the .05 level of probability.
[b] Significant at the .01 level of probability.

would be reduced very little even if expenditure levels were equated.[9]

On this basis the picture becomes more depressing when the central cities are compared with their outlying areas. For if Clark is correct, the very factors which would make for a higher quality education at a lower cost in the suburbs are, in fact, accompanied by higher cost levels. For the central city areas the 1962-63 expenditure levels and instructional costs, as well as the proportion devoted to fixed charges, and the pupil-teacher ratio are generally in accord with the quantitative judgments concerning the cost-quality results. The inclusion of the retirement system figures is designed to show that perhaps part of the failure to reconcile cost and quality is associated with differences in fixed charges.

Consideration of the sample areas and the level of expenditure clarifies the large central city school system and the area outside. The highest expenditures were in Rochester and New York City, and the lowest were in Birmingham, Alabama, and Norfolk, Virginia. The unweighted average for the 37 large central city school districts was $376.33. The weighted average was somewhat higher. The average in areas outside the central city, on the basis of the 1962 definition of the Standard Metropolitan Statistical Areas, was $438.38, or an average difference of $62.04. As is clearly evident, the difference exists not only in the aggregate but in most of the individual cases. If account is taken of the differential in the state responsibility for retirement systems, the differences are magnified and the few cases in which the central cities had higher expenditures than their outlying areas is reduced to insignificance.

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[9] Burkhead, Jesse. *Public School Finance: Economics and Politics.* Syracuse, N. Y.: Syracuse University Press, 1964. p. 86-87. (From chapter based on materials prepared by Harold F. Clark.)

For within central city variations see: Burkhead, Jesse; Fox, Thomas G.; and Holland, John W. *Input and Output in Large-City High Schools.* Syracuse, N. Y.: Syracuse University Press, 1967.

If these averages are placed in their national perspective, they show that per-pupil expenditures in both central cities and the non-metropolitan portions had expenditure levels lower than the national average, and only the areas outside the central city had expenditures in excess of the average. This involves a major change between 1957 and 1962. The specific figures are as follows:

	1957	1962
U.S. average (weighted)	$286.33	$392.48
Metropolitan portion (weighted)	326.27	422.72
Non-metropolitan portion (weighted)	243.51	348.99
Central city areas (unweighted)	312.27	376.33
Areas outside central city (unweighted)	303.17	438.38

Further, as will be demonstrated below, the data *understate* the difference between central city and areas outside the central city. If the data are correct, and there is no reason to suppose they are not, central cities are now closer to the non-metropolitan portions of the country than they are to their own areas outside the central city. This is consistent with the Clark hypothesis that good schools and high expenditures tend to go together, and that the converse also holds, i.e., that poor schools and low expenditures also go together. The statement holds with respect to the averages, more than to the individual areas, but it is also presumed to hold in the individual areas as well.

Before turning to the question of the determinants of current expenditures per pupil, let us consider the educational meaning of current expenditures. Unfortunately, detailed information on the breakdown of educational expenditures in areas outside the central city is not available. However, information is available on a national, state, and large-district basis. For the 37 large school districts, instructional expenditures make up slightly more than 70 percent of the total. As noted earlier, variations in the proportion covered by instructional expenditures are a function primarily of the extent to which retirement systems are reflected in the local school systems' expenditure account. This is clearly demonstrated in Table 5.

The extent to which expenditures in behalf of retirement systems influence the quality of education deserves serious consideration. But it also deserves serious consideration in the analysis of the variation among and between central cities and their outside areas. There are clear differences between states, but there are also differences within states. Based on the NEA Research Division data on expenditures per pupil in average daily membership for 1962-63,[10] the range of total expenditures is from $197.90 per pupil in ADM in Birmingham, Alabama, to $654.70 in New York City, a range from 1 to 3.31. In the case of instructional expenditures alone the figures are $172.34 to $413.98, or a considerably reduced range from 1 to 2.40. This reduction is due mainly to the differential in the responsibility for the retirement systems.

A much more important problem emerges in the case of the comparison of the central city and the areas outside

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[10] National Education Association, Research Division. *Selected Statistics of Local School Systems, 1962-63.* Research Report 1964-R11. Washington, D. C.: the Association, 1964. p. 34 and 35.

TABLE 4.—REGRESSION EQUATIONS

Central City and Outside Central City Per-Pupil Expenditures

	Income	Enrollment Ratio	State aid per pupil	Constant	R	R^2
DEPENDENT VARIABLE						
(A) Per-pupil expenditures in central city	+.1618 (.0439)			41.72	.5289	.2797
	+.1556 ^{a} (.0357)	−13.1967 ^{a} (3.0332)		281.50	.7330	.5373
	+.1391 ^{a} (.0385)	−12.9172 ^{a} (3.0321)	+.2253 (.2009)	282.6291	.7445	.5543
Elasticity	.9703 ^{a} (.2089)	0.6313 ^{a} (.1408)	.0325 (.0568)		.7709	.5942
(B) Per-pupil expenditures in outside central city	+.2150 ^{a} (.0394)			−30.66	.6778	.4594
	+.1954 ^{a} (.0425)	−5.8849 (4.6640)		144.7771	.6958	.4841
	+.1766 ^{a} (.0348)	−8.6275 ^{b} (3.8360)	+.6095 ^{a} (.1410)	146.8650	.8186	.6701
Elasticity	+1.0740 ^{a} (.1960)	−.3701 (.2302)	+.1448 ^{b} (.0545)		.7785	.6061

Note: Values in parentheses are standard errors.
[a] Significant at the .05 level of probability.
[b] Significant at the .01 level of probability.

the central city. In several states with large cities there are differences in the responsibility for retirement systems between the central cities and the rest of the state.

It is the general contention of this paper that differences in the assignment of the responsibility for retirement systems have had the effect of obscuring an even broader gap between central city and the areas outside the central city than is observed. Further, the phenomenon is the result of a deliberate policy developed in the early part of the twentieth century to bring more qualified teaching and administrative personnel to rural areas. This gave rise to the state assumption of the responsibility for financing retirement systems when the cities often had their own established retirement systems or did not wish to merge them with the rest of the state. If this is correct, this means that there is an understatement of the expenditures in behalf of local school districts in the areas outside the central city and in the metropolitan areas. Since this is not true of all states, it must be analyzed on a state-by-state basis.

II. The Determinants of Large City Educational Expenditures Per Pupil, 1961-62, in Their Metropolitan Context

A considerable body of literature dealing with the determinants of educational expenditures started at the beginning of the twentieth century and has extended to the present. At the turn of the century, Cubberley, Strayer, and Elliot, to cite some of the most im-

TABLE 5.—CURRENT EDUCATION EXPENDITURES PER PUPIL, 1962, AND LOCAL GOVERNMENT CONTRIBUTION TO RETIREMENT SYSTEM

City	Central city		Outside central city		Difference
	Current education expenditures per pupil	Major local government contributions	Current education expenditures per pupil	Major local government contributions	
1	2	3	4	5	6
New York	$536.88	+	$684.34	+	$−147.36
Chicago	408.51	+	473.69	0	−65.18
Los Angeles	437.14	0	626.88	0	−189.54
Philadelphia	397.75	+	492.90	0	−95.15
Detroit	461.67	+	434.10	0	+27.57
Baltimore	366.07	+	421.61	0	−55.54
Houston	290.09	0	450.35	0	−160.26
Cleveland	370.59	+	459.50	+	−88.91
St. Louis	386.58	+	423.73	0	−37.15
Milwaukee	377.96	0	469.38	0	−91.42
San Francisco	466.77	+	519.49	0	−52.72
Boston	385.46	0	465.36	0	−79.90
Dallas	301.96	0	325.40	0	−23.44
New Orleans	271.87	0	233.05	0	+38.82
Pittsburgh	368.00	0	450.98	0	−82.98
San Diego	414.63	0	538.95	0	−124.32
Seattle	409.89	0	415.72	0	−5.83
Buffalo	447.03	+	561.20	+	−114.17
Cincinnati	373.11	+	577.74	+	−204.63
Memphis	227.58	0	245.71	0	−18.13
Denver	418.30	+	380.74	0	+37.16
Atlanta	272.52	0	287.80	0	−15.28
Minneapolis	414.31	+	442.23	0	−27.92
Indianapolis	352.87	0	467.92	0	−115.05
Kansas City	409.19	+	350.67	0	+58.52
Columbus	327.40	+	332.06	+	−4.66
Newark	496.21	0	522.23	0	−26.02
Louisville	301.44	0	477.73	0	−176.29
Portland (Oregon)	421.59	0	480.14	0	−58.55
Long Beach	426.33	0	605.54	0	−179.26
Birmingham	194.43	0	233.84	0	−79.46
Oklahoma City	269.23	0	291.67	0	−22.44
Rochester	580.05	+	573.07	+	+6.98
Toledo	377.71	+	511.85	+	−134.14
St. Paul	415.51	+	452.88	0	−37.37
Norfolk	265.43	0	288.65	0	−23.22
Omaha	282.58	+	394.90	0	−112.32

Source:
Compiled from *Census of Governments, 1962*, U.S. Bureau of the Census.

portant figures in educational finance, all dealt with the problem by using correlation analysis. Cubberley, for instance, explicitly raised the problem in his doctoral dissertation which dealt with the apportionment of state aid. The problem of the large city was recognized as unique, but it was unique in a positive sense with its enormous concentration of wealth, industry, and population. The position of the large central city has changed since the beginning of the twentieth century, although not to a similar extent throughout the country. The large city-rural dichotomy which perturbed Cubberley, Strayer, Haig, and others and which led to the modern foundation program of state aid, no longer exists in the form in which these earlier dedicated scholars viewed the problem. The rise of the suburb, especially after World War II, significantly changed the picture, although it did not change the underlying system of finance.

In recent years, analyses of the determinants of large city school finances have not been as prominent as the analyses of interstate or intrastate variations. The question of the determinants of large city school expenditures has been extensively explored on an individual school district basis, or in terms of the specific implications of fiscal dependence and independence on expenditures. Very few analyses have taken into account the metropolitan context of large city school finances.

The most important recent study, that of James, Kelly, and Garms, deals with the large school system as opposed to the large city school system. While many of the results are directly comparable to those reported in this paper, there is an admixture of central city districts and districts outside the central city which makes their results difficult to interpret in relation to the large cities. Further, there is no standard of comparison such as that which is introduced when the determinants of the areas outside the central city are explicitly considered.

The studies of the determinants of educational expenditures may be divided into two groups, which in turn are often combined in a single analysis. One approach, often associated with "the cult of efficiency," involves an internal analysis of the expenditure categories responsible for the observed level of expenditures. Many of these were considered in terms of weighting, e.g., the differential cost of providing elementary and secondary education, the differential between academic and vocational education, between regular education and special education, between schools and school districts of different sizes, or the differential in salaries of entering teachers, or in operation and maintenance charges, or the differential in teacher training and experience.

The second approach analyzes factors which are not directly components of cost. At the turn of the century, Cubberley analyzed property values and Elliot analyzed noneducational expenditures, but in recent years policy considerations and the computer have been responsible for the introduction of an extraordinarily large number of factors. In addition to property values and noneducational expenditures, income, racial and ethnic composition, the extent of fiscal dependence, educational attainment, extent of owner-occupied housing, unemployment, the proportion of children going to public school or the proportion of the total population going to public school, and community homogeneity have been explicitly introduced. In the case of state aid and now federal aid, which in this analysis is considered belonging to the second group, there are differences of opinion as to whether they should be considered as belonging to the first or to the second group. In many analyses, determinants belonging to both groups have been introduced into a single analysis. This creates great difficulties especially if one of the cost elements is dominant.[11]

The general approach of this analysis is along the second path, namely, to analyze the external factors which are presumed to determine the variations in per-pupil current expenditures, rather than to analyze the variations of the elements which directly or indirectly comprise the per-pupil expenditure. Insofar as they may be considered special, the specific problems raised by state aid and the metropolitan context will be faced when they are reached. Further, the factors which influence the educational dimension of large city school finances will be compared directly with their behavior in the areas outside the central city. The aim is to see whether a given factor or factors in combination operate differently in their central city environment from the manner (defined in quantitative terms) in which they operate outside their central city. It is presumed that the area outside the central city, almost but not exactly a synonym for suburbia, may serve as a standard of reference.

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[11] Miner, Jerry. *Social and Economic Factors in Spending for Public Education.* Syracuse, N. Y.: Syracuse University Press, 1963. 159 p.

On the basis of a limited number of variables, both individually and in combination, the educational dimension of large city school finances will be assessed in its metropolitan context. The specific variables chosen have all been recognized as important in previous studies, with the possible exception of the metropolitan variable. A prior analysis of the same variables for 1957, but dealing with a greater range of variation, indicated the importance of the following variables:

1. Income
2. The proportion of total population attending public schools
3. State aid
4. Metropolitan educational variable.

A large number of other variables were also considered. Some of these had to be rejected at this time because of analytical difficulties, others were not available, and finally some were very highly intercorrelated with one or more of the variables chosen. The first three were relatively independent of each other in 1957, and as will be shown, were still relatively independent of each other, both inside and outside the central city areas. The fourth variable introduces the problem of multi-collinearity with a vengeance, but the nature of the multi-collinearity is of great interest. Finally, none of the simple relationships seem to be at variance with those of James and his colleagues who had a much larger sample.

There are various measures of income. Of these, the most familiar are median family income and per-capita income. Because of its greater availability and ease of computation, as well as some substantive reasons associated with the fiscal measures and elasticity, the analysis is based on per-capita income. As herein computed, it is the aggregate personal income (Census definition) divided by the 1960 population. It has been presumed, and most studies have demonstrated, that per-pupil expenditures are a positive and significant function of income. The broader the area covered, the better the "fit." Thus, as shown in the Welch data herein reported, per-pupil expenditures show a much higher correlation with income on a state level than on an intra-state or smaller area. This reflects the fact that income is less related to the property tax base the smaller the geographic unit analyzed. In addition, other factors, such as the enrollment ratio and state aid, become more important the smaller the geographic area. As used in this study, the assumption is that income is a demand variable, rather than both a demand and a supply variable. It is further presumed that income is closer to being a supply variable outside the central city than within the central city's boundaries. Therefore, it is presumed that not only will education make up a larger proportion of per-capita income outside the central city than within the central city, but that "fit," as measured by the correlation coefficient and standard error, will not be as close. Finally, it is presumed that the income elasticity of per-pupil expenditure will be about unity, i.e., a 1-percent increase in income will lead to a 1-percent increase in expenditures per pupil.

The second measure, enrollment in public schools as a proportion of total population, reflects the age distribution of population, and also the availability and use of nonpublic elementary and secondary educational institutions. The latter are made up of both private and parochial schools. Other studies, such as that of James, Kelly, and Garms, and that of Miner, report just the proportion of school population attending private schools. There is greater relative and absolute variation among central city areas than among areas outside the central city in the enrollment ratio. The major question concerning the enrollment ratio involves the extent to which the per-pupil expenditures might (a) be reduced because a portion of the school children must be paid for privately, or (b) the extent to which the expenditure might be increased because the resources per pupil have been enhanced. The assumption of this study, based on prior evidence, is that the higher the enrollment ratio the lower the per-pupil expenditure. This does not mean the total resource usage remains the same; that problem must be dealt with directly. It does mean that the restrictive effect caused by the use of nonpublic schools on per-pupil expenditures is less than the resources freed. It is presumed that the effects would be about the same in direction, but less in importance in the areas outside the central city.

The third variable is the most controversial from an analytical point of view. Renshaw,[12] in an influential article, found that state aid is (positively) related to expenditures per pupil. Others have argued that state aid should be interpreted in the same manner as cost element, and hence to include it as both a dependent and an independent variable is inappropriate. The problem, as stated here, does not involve the double-counting of federal aid. As was presumed on the basis of the 1957 analysis and from an analysis of county-wide data in New York State there is no necessary connection between state aid and expenditure per pupil, and indeed the correlation may, in fact, be negative rather than the presumed positive correlation. Finally, it should be noted that there is no fixed relationship between the amount of aid per pupil and the proportion of current expenditures made up by that aid.

The final variable to be introduced is perhaps the most complex to interpret. Its introduction is designed to determine the extent to which the previous three variables explain the metropolitan context. Unlike the prior variables the introduction of this variable brings the problem of multi-collinearity, i.e., the interdependence of the several variables to the forefront. The assumption is that the introduction of this variable should improve the explanatory power of the total model by a considerable amount. This is because both the central city and the outside areas respond to this phenomenon and they interact with each other. It is not presumed that the variations in the one explain the variations in the other, but that owing to what has been called a labor-market-demonstration effect, they move together. This variable will then be analyzed individually, and its analysis will serve as a transition to the last section of the analysis.

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[12] Renshaw, Edward I. "A Note on the Expenditure Effect of Aid to Education." *Journal of Political Economy* 67:170-74; April 1960.

As noted earlier, the critical supply variable is left out of the picture. That variable is the property tax. Since it is difficult to get data on a comparable basis as between states and often between the central city and areas outside the central city, no such information was included in the total. A detailed analysis based on New York State (see Table 2) as well as the results reported by the James, Kelly, and Garms study indicate the importance of the variable.

The simple correlations between the various independent variables and the current expenditures per pupil as reported in this study and previous studies are shown in Table 2. They are shown in the same order they will be introduced in the stepwise regression which was referred to earlier. In addition, some other variables which were not utilized but which appear to be of interest are also shown. Income is clearly significantly associated with each of the per-pupil expenditure variables in all studies save that of Miner. Further, apart from the state-wide results reported by Welch, which are a replication of earlier findings by Renshaw, Shapiro,[13] and others, the results are not only significant but they are approximately of the same order of magnitude for different samples drawn from different years. The co-variation between income and per-pupil expenditures is thus clearly demonstrable on a simple correlation. On the other hand, it is never so high as to warrant the conclusion that other factors are not unimportant at least in principle. If the stepwise multiple regression analysis were to take place by automatically inserting the highest valued correlation first, it is clear that income would rank very high, if not first.

The second variable, the enrollment ratio, also shows a basic familial resemblance between samples, and between slightly altered definitions. In all cases the negative sign is evident or implied. This is true when the proportion in private school is interpreted as one minus the proportion in public school.

The variable that shows the greatest variation is state aid per pupil. For while the data drawn from the central city/outside central city samples for the years 1957 and 1962 operate in the expected manner, this is not the case in the New York State sample. The county-wide data for 1963, 1964, and 1965 show a clear and significant negative correlation between state aid and the per-pupil expenditure. At the level of the simple correlation one would have to disagree with the notion of a positive correlation between state aid and per-pupil expenditures. This is because state aid is computed on the basis of per-pupil valuation which is very highly correlated with per-pupil expenditures. For the year reported, 1965, the correlation was +.811.

Other variables considered, which are very difficult to interpret, were the proportion nonwhite, the proportion receiving a given amount of education (highly correlated to the preceding and to per-capita income), and various measures of fiscal dependence and independence will be reported on later.

The results of the stepwise multiple regression analysis are shown in Table 4. The first variable, income, shows a significant positive correlation with per-pupil expenditures in both central city and areas outside the central city areas.

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[13] Shapiro, Sherman. "Some Socioeconomic Determinants of Expenditures for Education: Southern and Other States Compared." *Comparative Education Review* 6:160-66; October 1962.

TABLE 6.—REGRESSION EQUATIONS: DIFFERENCES BETWEEN CENTRAL CITY AND OUTSIDE CENTRAL CITY PER-PUPIL EXPENDITURES AND SELECTED INDEPENDENT VARIABLES

Difference in income 1	Difference in enrollment ratio 2	Difference in state aid 3	Constant 4	R 5
.0240 (.0307)			−59.30	.1308
.0164 (.0307)	−4.6991 (3.3541)		−85.48	.2660
.0266 (.0294)	−5.3406 (3.1871)	+.4939[a] (.2216)	−67.74	.4385

[a] Significant at the .05 level of probability.

The correlation is higher and the slope is steeper in the areas outside the central city, the latter not being a necessary consequence of the former: expenditure per pupil increased by $.1618 for every dollar of per-capita central city income; in the area outside the central city the average increase was $.2150. The results are very challenging because they show that the difference in the response is far greater than the difference in average income. Given the same income, the per-pupil expenditure in the area outside the central city would be higher. At the average level of income per pupil, expenditures are estimated at $469.05 in the areas outside the central city and $334.62 in the central areas, a considerably larger gap than appeared in the raw data.

The introduction of the enrollment ratio as an explicit variable had a negligible effect on the income variable in both central city and areas outside the central city. The effect of its introduction is far greater in the central city than in the areas outside the central city areas. Specifically, the introduction of the variable raises the coefficient of correlation from .5289 to .7330 in the case of the central city areas, but its effect on the outside areas was trivial, from .6777 to .6953. Specifically, the introduction indicates that for each one percentage point increase in the enrollment ratio, per-pupil expenditures decreased by $13.1967 in the central city areas and by $5.8849 in the outside areas. The latter, while negative, did not represent a significant decline in expenditures. This indicates that a central city with a high income and a low enrollment ratio will be associated with a high per-pupil expenditure. On the other hand, only the income effect will be really operating in the case of the areas outside the central city.

The last variable to be introduced in this first stage is that of state aid per pupil. The introduction of the state-aid variable does not add to the total explanatory power of the model in the central city case. There appears to be a slight displacement of income in favor of aid, but the changes are at most negligible. These results are striking because in areas outside the central city the introduction of state aid per pupil is significant in itself, and because it also places the explanatory power of the enrollment ratio in a more powerful role. The explanatory power of the three variables increases from an R^2 of .4693 to .6701 as a result of the introduction of the state-aid variable. In the case of the central city areas the increase was from .5368 to .5543. Thus, while it is possible to explain more of the variation in the areas outside the central city, the key to the difference lies in the differential effect of state aid.

These results are confirmed by the elasticity measures. With the same stepwise technique, the significance of the several variables conformed to the pattern obtained with the absolute values. The income elasticity of per-pupil expenditures is significant in both the central city and the outside areas. In neither case are the income elasticities significantly different from unity.

However, in the outside areas the income elasticities are higher and more significant. The elasticity of the enrollment ratios is negative and significant in the central city areas, and negative but not significant in the case of the outside areas. Finally, aid appears to be significantly greater than zero outside the central city areas, but not so in the central city areas under their appropriate regression equations. The results are all reported in Table 4.

III. Determinants of Differences Between Central City and Outside Central City Educational Expenditures

The last section of this paper is devoted to an analysis of the relationship between the central city and outside area levels of education per pupil. This was noted earlier in the analysis of the relationship between the two; however, little was done at that time apart from comparing the levels on an individual area basis. For not only is it accurate to note that on the average there is a significant difference among the resources per pupil expended in the central city, but there is also a difference that appears in all but a limited number of cases, as indicated in Table 5, between the central city and its outlying areas. This is enhanced by the fact that in the small number of areas where expenditures in the central city are higher, part of this can be attributed to the state assumption of the financing of retirement systems. However, a number of important questions concerning the factors influencing the observed differences remain unresolved. Before attempting to answer these questions directly, I shall undertake a transitional analysis involving the central city and its outside areas.

On the basis of this and earlier analyses it was decided to ascertain the effect of the level of expenditures of the areas outside the central city on the central city and of the central city on the outside area. The attempt is made to ascertain the additional amount of explanatory power available if these variables are introduced. How much additional explanatory power over and above that derived from the three factors thus far considered is measured by the additional contribution of metropolitan interactive variables. In the case of the central city areas the introduction of the outside areas variable increases the explanatory power from 55.4 percent to 73.2 percent. The increase in the case of the outside area is much less, from 67.0 percent to 73.9 percent. The implication is that a far larger proportion of the total variance is included in the factors determining the outside areas than in the central city areas. It appears that the central city is more reflective of the outside area than vice versa. The preliminary indication is that income outside the central city is a far better predictor of both outside the central city educational behavior than is the income of the central city itself. But there is the other very suggestive hypothesis that the causation is via a demonstration-labor-market effect and that the causation is from outside the central city in, rather than the earlier situation where the central city determined the level of the entire area.[14]

The last step of the analysis is designed to see which, if any, of the factors analyzed are responsible for the observed differences between the central city and its outside areas. Or, put in a more positive vein, to what extent are differences in income, enrollment ratios, and state aid responsible for the observed differences in per-pupil current expenditures. The results are at variance with many of the assumptions commonly made concerning the reasons for the differences. The most important single determinant and the one which is common to the central city and its outside area expenditures is income. In both the central city and its outside areas the enrollment ratio also plays a significant role, while in the case of the outside areas variation in state aid is significant.

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[14] Sacks, Seymour, and Ranney, David. *The Allocation of Fiscal Resources to Large City School Districts.* Chapter 2. (A study to be published by the Syracuse University Press.)

The general presumption is that differences in per-capita income lead to differences in per-pupil expenditures; that the greater the difference in income the greater the difference in expenditures. The results of the detailed analysis do not show any systematic relationship between the differences in income and the differences in per-pupil expenditures. For the sample analyzed, it does not appear to make any difference whether the outside area income is higher or lower, the expenditures per pupil outside the central city are higher, with no systematic relationship between the two. The correlation and, consequently, the regression coefficient are low and insignificant. The gap in the expenditures is not a function of the gap in income. Areas outside the large cities have higher per-pupil expenditures, whether or not they have higher incomes. That this might be a function of the definition of income seems highly unlikely, but is still in the realm of the possible.

In a similar vein the introduction of the enrollment ratio shows that differences in the enrollment ratios are also unrelated to differences in expenditures per pupil. Although the enrollment ratio is lower in the central city, it is reflected in higher expenditures as one would hypothesize. It has more significance than the income variable, but it is not significant in a statistical sense. The use of a less powerful statistical test might show that these differences in enrollment ratios operate in the expected direction, but they are not as powerful as one would expect.

The final variable introduced is the difference in state aid. This variable was found to be very important in explaining variations in the areas outside the central city, but not in the central city areas. Unlike the prior two variables, the differences in state aid do operate to create a larger gap between the central city and its outside areas. The introduction of this variable enhances the importance that one might give to the enrollment ratios, but it still does not explain as much as one would have expected.

The surprising result is the lack of effectiveness of income differences in explaining expenditure differences. Not only is this evident in the case of the simple relationships, but also it persists in the more complex relationships which take into account the differences in state aid and differences in enrollment ratios. The issues raised by these differences are considerable. The Elementary and Secondary Education Act is explicitly designed to rectify some of these differences. However, it is quite clear that areas outside the central city have higher expenditures than their central city counterparts, but the reasons do not fall into any simple pattern associated with the important variables responsible for their variation. The problem of providing a basis for adequate federal aid, therefore, becomes more complex.

Conclusions

1. There is a gap between the per-pupil current expenditures in the cen-

tral city and per-pupil expenditures in areas outside the central city. This gap in the educational dimension of school finance is of relatively recent origin.

2. The gap is understated because of the differentials in the state assumption of retirement systems contribution. In many states only the large cities have their own system or make local government contributions to retirement systems in behalf of their teaching and nonteaching staffs.

3. A comparative analysis of central cities—in their metropolitan contexts—highlights differences in per-pupil expenditures, which an analysis concentrating only on large cities would not bring out. The results confirm and supplement most, but not all, of the existing body of knowledge.

a. While income is a significant determinant of per-pupil expenditure in both the central city and areas outside the central city, it is equivalent to a larger proportion and is more responsive to income in the suburban areas.

b. The enrollment ratio is a significant determinant of the level of expenditures especially in the large central cities, the lower the enrollment ratio the higher the per-pupil expenditures.

c. State aid for education plays a critical role in the areas outside the central city as expected, but it does not play its expected role in the central cities. The results are of interest on both an analytical and a substantive level. On the analytical level they show that it need not be true that state aid has any direct identifiable relationship with per-pupil expenditures. The problem of state aid for education in central city areas is very complex. The implication for federal aid is a similar complexity when its role is viewed in a metropolitan context. The necessity for a more refined analysis of the interaction between central city and suburb is clearly evident.

4. The gap in educational expenditures between central city and suburb cannot be "explained" by income differences, at least by the differences in income which appeared so important in explaining the variation among central cities and among the areas outside the central city; nor do differences in enrollment ratios explain the differences in expenditure levels. The only factor which appears to be statistically significant in explaining differences in per-pupil expenditures is the difference in state aid per pupil.

5. The results of an analysis of the educational dimension of expenditures do not show anything concerning the relative fiscal problems of central city or suburb. At this stage they show only that other things being equal, large cities have a greater variety of factors at work than the areas outside the central city.

The Fiscal Impact of a High Concentration of Low-Income Families upon the Public Schools

Carl E. Thornblad

THE GREAT CITIES of the United States have become meccas for the poor. Immigrants from Europe flocked to this country during the last half of the 19th century and the first half of the 20th century to improve their social and economic position. During the past two decades the poor have moved to the large cities for the same reasons.

It is generally agreed that education is the one most important factor in social and economic mobility. However, the poor cannot afford to pay the cost of the education they need. It is in the national interest that the bill be split up among those who can afford to pay. The main point of this paper is directed at *the fiscal impact of a large concentration of low-income families upon the public school* and how the cost of educating the poor can be equitably shared.

The current method of financing public education in most large cities requires the populace of the city to pay the largest portion of the cost involved. This type of fiscal policy assumes that those who can pay are able to absorb the cost of those who cannot pay. To overcome the difference, state equalization aid is available in a limited amount. However, the poor come to the large cities from all over the nation, not just from within the state.

National policy is currently bent on the elimination of poverty and dependency through various means. Two of the major programs in the "war on poverty" are housing and education. These two programs presently tend to work against each other. The public housing projects are exempt from property taxes but pay a small payment in lieu of taxes for local governmental services. The largest single governmental service required by the residents of these projects is education. Federal aid to education is for supplementary programs only, leaving the major cost of education for this group to be provided at the local or state level. What is the real impact of the poor on a large city educational system? [1]

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This paper is based on a monograph of the same title published by the Great Cities Program for School Improvement which in turn was based on an unpublished doctoral dissertation, University of Illinois.

[1] The data presented here refer to one large city, Chicago.

It is quite evident that public housing is a step leading from poverty and public welfare toward the middle-income brackets and upward social mobility. There does seem to be some apparent danger that by its selective processes, public housing is not getting at the very "hard core" poverty groups that are most in need of the services it can offer. It may be that the effective leadership and the examples of upward social mobility are leaving the very low-income areas via public housing and thereby creating problems much more difficult to overcome. Groups of very low-income people are becoming economically and socially isolated. For education to reach these groups and to be effective is a challenge that will take much more personnel and money than is now available. This is indicated by the fact that in almost every case in which the schools of the public-housing sample were compared with a control group of schools in a low-income area where very few public housing projects existed, the low-income control area did not fare as well as the public-housing sample.

Public Housing

Public housing as a part of the national welfare program gained momentum after World War II. By 1965 more than half a million families were living in public housing units. In Chicago more than 31,000 units were occupied in 1965. At the present rate of construction, more than 75,000 units will be available in Chicago within the next 10 years.

The educational significance of these data is that *families residing in public housing units have an average of 3.5 children each,* the majority of which are of school age. This would mean that more than 200,000 minors will be living in public housing units in Chicago in 1975.

Approximately one-third of all public-housing families are on aid to families with dependent children (AFDC). For these families governmental aid is supplying housing and subsistence. In effect, these children are wards of the government. In Chicago in 1965 there were more children in families with incomes of $2,000 and over getting practically their entire income from AFDC payments than there were children from families with incomes under $2,000, regardless of the source of income.

The typical AFDC family consists of a mother and three children. Only about one family in four has the father in the home. The more education the mother has, the less she needs to rely on welfare aid.

Comparative Education Data

Public housing concentrates a large number of children of school age in a very small area. The density of public-housing children attending the public schools of Chicago is higher than for any other group sampled in this study. The public-housing group also had the highest percentage of Negro pupils. The number of pupils in the higher grades decreases markedly in the public-housing and low-income area schools as compared with an almost stable size for all elementary grades in the middle-income and upper-income areas.

A study of overage and underage pupils in elementary schools showed the public-housing sample to rank midway between the low-income area, which had the largest percentage of pupils a year or more older than expected, and the middle-income area. The high-income area had only about one-third of the percentage of overage pupils as the middle-income area and about one-fourth the percentage of the low-income area.

One of the major problems of low-income groups is the rapid movement of a large number of people into an area. Between 1955 and 1965 the enrollment in schools serving the public-housing sample increased 97.9 percent. In the low-income area the increase was 95.8 percent. This may be compared with a 12.8-percent increase in the enrollment in the middle-income area and a very stable 1.2-percent increase in the high-income area. To illustrate the rapidity of the low-income population mobility: More than half of the total 10-year increase in the enrollment of the public-housing sample came during a single 12-month period.

The Staff

The public-housing sample, located in less than one-fourth the area of each of the other groups, employed in its schools more than *14 times* as many professionals as the high-income area and almost 10 times as many as the middle-income area. The low-income area employed only about two-thirds the number of professionals as the public-housing sample.

The majority of teachers in each group had no more than a bachelor's degree as recognized for salary purposes. The chances are that a pupil in the schools in the public-housing sample will have during his 9-year elementary program (including kindergarten) one teacher, maybe two, with an advanced degree. A pupil in the low-income control area may have only one teacher holding an advanced degree. In the middle-income area a pupil is likely to have two advanced-degree teachers and in the high-income area the average pupil probably will have at least three graduate-degree teachers.

Experienced teachers tend to move into the areas with higher income levels. If a school has 33 teachers and a principal, it will probably have about 25 teachers on the first 10 salary steps, with 11 of these on the very first step if it is in the public-housing sample. If a similar size school is in the low-income area, about 25 of the teachers will be on the first five salary steps and 16 or 17 of them will be at the beginning rate. The same size school in the middle-income area will have only four teachers at the starting salary, four more on the next three steps, eight teachers on steps five through nine, and eight more between steps 10 and 24. At least one-fourth of the teachers will be paid for 25 or more years of experience. Over three-fourths of the teachers in a similar school in the high-income area will be paid for more than 10 years' teaching experience, and more than half the teachers will have 18 or more years' experience to their credit. The upper quartile of the teachers in the high-income area will have more than 28 years' teaching experience each.

In this study the experience factor had the largest variation of any single item affecting the education of the pupils. For various reasons teachers seemed least likely to remain in the low-income control area. The public-housing sample schools apparently had more "holding power" than the low-income schools. The wide margin between the percentage of experienced teachers on and above the tenth salary step in the two lower-income groups and the two higher-income groups was due in part to the large number of new buildings serving the lower-income groups, but, no doubt, also reflected the many problems confronting beginning teachers serving these pupils. Detailed study of why teachers really leave these areas and what can be done to induce them to remain appears to be a top-priority research problem. The role that teacher education can play in this situation has been considered in some detail by the Research Council of the Great Cities Program for School Improvement and Northwestern University in a cooperative project sponsored by the U. S. Office of Education.[2]

Staffing Ratios

The differences in pupil-teacher ratios and in the number of professionals per 1,000 pupils in these areas are not significantly different. The only differences of any consequence are in the numbers of auxiliary teachers assigned per 1,000 pupils. However, the greatest variance occurs in the middle-income area where there are more pupils per auxiliary teacher than in any other group. Actually, the slight difference in the number of classroom teachers favored the schools in the low-income areas with the low-income control area have the most favorable ratio of total classroom teachers to pupils. The other three groups had a variation of only 0.6 pupil per teacher. The range of differences among the four groups was only 1.3 pupils per classroom teacher. The range of differences of total professionals assigned to school buildings for all of the groups was only 1.8 professionals per 1,000 pupils, a very small difference considering that more than 30,000 pupils were considered in this study.

From the data in this study it appears that there is no difference in the assignment of professional staff to the various schools, with the exception of the training and experience of the individual teachers. Present Board of Education policy of allowing the voluntary transfer of regularly certified teachers seems to be the major reason for the wide variation in the number of highly experienced teachers in the various areas. The effect of a planned placement program, a rotation type assignment pattern for teachers, might prove to be a valuable research project leading to a more equitable placement policy.

School Buildings

Historical records confirm that there are more old buildings housing pupils in low-income areas than in the middle-income and high-income control areas combined. However, the middle-income control area has not had a new building or major addition *for a quarter of a century*. For *every* new building or major addition in the high-income control area, 10 buildings or major additions have been constructed for low-income pupils. The majority of them house elementary-school pupils. In most cases the elementary schools serving pupils in low-income areas have been larger buildings, owing to the higher density, than those built in the sparser middle-income and high-income areas.

The Cost of Educational Programs

Functional analysis of the cost of educational services was applied to three comparative cost methods: (a) the total dollar budgeted expenditures, (b) the pupil budgeted expenditures, and (c) teaching unit budgeted expenditures. Only budgeted items assigned to schools were considered. Central office administrative expenditures and other expenditures not assigned by school were omitted from this study.

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[2] Chandler, B. J., and others. ***Research Seminar on Teacher Education.*** U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. G-011. Evanston, Ill.: Northwestern University and Research Council of the Great Cities Program for School Improvement, 1963. 171 p.

Total Dollar Costs

In total dollars the public-housing sample schools were allocated $917 million more than the high-income control area. This was very close to 1,000 percent more than the $971,720 spent in the high-income control area. Compared with the middle-income control area the public-housing sample group was allocated in addition $9.1 million or about 600 percent more money. The sample group was budgeted approximately 50 percent more money than the low-income control area. From these figures it seems that *public housing creates a higher total cost per square mile for public education than any other type of residential area.*

Per-Pupil Costs

Per-pupil costs tend to give a more realistic portrayal of how much is being spent according to how many are being educated. Unfortunately, current practice merely compares the total amount spent per pupil without a breakdown of what the money is buying. The use of functional analysis allows a comparison of services required and the cost of each. The difference between the $318.69 per pupil in the public-housing sample and the $425.76 per pupil budgeted for the middle-income control area schools amounts to $107.07. However, *the difference between the amounts spent on instructional services is only $17.39 per pupil.* Thus, $89.68 of the difference between the total per-pupil budgeted cost figures is spent for supporting services, or, in the terminology of the business world, overhead.

While per-pupil cost figures are frequently used for comparative purposes, they do not reflect true educational cost data because *pupils are taught in classes, not individually.* To equate the true cost differences, the teaching unit offers better comparative data than per-pupil costs. This method more nearly approximates the way the major portion of educational expendi-

TABLE 1.—BUDGETED EXPENDITURES PER $1,000 OF BASIC TEACHER COST FOR THE SAMPLE GROUP AND THE CONTROL AREAS

Function	Sample group	Control areas		
	Public housing	Low income	Middle income	High income
1	2	3	4	5
INSTRUCTIONAL SERVICES	$340	$217	$ 422	$ 669
Regular K-8 experience and training premiums	347	217	413	680
Special education experience and training premiums	213	210	552	290
SUPPORTING SERVICES	535	595	1,039	925
Administration	156	173	197	216
Auxiliary services	81	89	107	124
Materials and supplies	46	44	46	48
Plant operations	252	289	689	537
NONEDUCATIONAL SERVICES	2	3	10	...
Total budgeted expenditures for services per $1,000 basic teacher expenditure	$877	$815	$1,471	$1,594

TABLE 2.—COMPARISON BY FUNCTION OF THE BUDGETED EXPENDITURES PER $1,000 OF BASIC TEACHER COST OF THE PUBLIC-HOUSING SAMPLE WITH THE CONTROL AREAS

Function	Sample group	Control areas		
	Public housing	Low income	Middle income	High income
1	2	3	4	5
INSTRUCTIONAL SERVICES	1.00	0.64	1.24	1.97
Regular K-8 experience and training premiums	1.00	0.63	1.19	1.96
Special Education				
Experience and training premiums	1.00	0.99	2.59	1.36
SUPPORTING SERVICES	1.00	1.11	1.94	1.73
Administration	1.00	1.11	1.26	1.38
Auxiliary services	1.00	1.10	1.32	1.53
Materials and supplies	1.00	0.96	1.00	1.04
Plant operations	1.00	1.15	2.73	2.13
NONEDUCATIONAL SERVICES	1.00	1.50	5.00	...
Total per $1,000 basic teacher cost	1.00	0.93	1.68	1.82

tures, that for teachers' salaries, is spent.

The largest single item of expenditure that appears in the functional analysis of the teaching unit is the teacher's salary. Salary for teachers is computed by the use of three components: (a) the basic salary, (b) a premium for experience, and (c) a premium for training. To get a true picture of the instructional services being purchased, salaries were analyzed according to the component expenditures. Thus, all teachers were equated by their basic salary, the beginning rate, and the differences based on experience and training were computed.

It was found that the cost per teacher as a result of training was so small that it was insignificant when viewed as a percentage of either the total salary or the basic salary; therefore, the training premium and experience were combined for further analysis.

A functional analysis index (FA Index) was constructed for the purpose of comparing the *differences* in the cost of instructional services and the total cost of supporting services. This was done by subtracting the teacher's basic salary from the total salary, leaving only the training and experience premiums. These tend to present the differences in each teacher for which the Board of Education is willing to pay. To overcome the effect of differences in the basic salary in various school systems throughout the country and to offset any economic fluctuations, the FA Index was refined to a consideration of expenditure per $1,000 of basic teacher cost.

By the use of the FA Index, Table 1, it was possible to construct a comparison of functions, Table 2, that demonstrated the responsiveness of the true difference in the budgeted expenditures between sample group and control areas. The function comparison table uses a base of 1.00 or 100 percent to represent the expenditure for a given function for the sample. The cost of the same function for any control group is relative to 1.00. Thus, comparison is possible *between groups* for any particular function.

For comparison of allocations within groups a percentage distribution of the FA Index was computed. As the real production unit of education is the teacher, the supporting services can be viewed, as previously stated, as overhead costs. If this premium is acceptable, the efficiency of a school system or a part of a system can be measured by the percent of funds allocated to productive services and to overhead costs. In any business the guiding principle is to reduce overhead and increase productivity.

Summary of Cost Findings

The largest variation between groups, according to the FA Index, was found in the combined premiums paid for experience and training to regular classroom teachers. The sample and control groups ranked as follows:

Group	*FA Index for premiums*	*Difference*
Low-income control area . .	$217	. . .
Public-housing sample group	347	$130
Middle-income control area	413	196
High-income control area	680	463

The figures above indicate that the public-housing sample group and the middle-income control group more nearly approximate each other than any other group. The low-income control area had the least amount of salary per basic teacher cost being paid for experience and training, while the high-income control area had many more dollars per basic teacher cost going into these premiums than any other group.

From these data it appears that the more experienced teachers are transferring to the high-income areas and remaining there. If teachers were transferred to equalize the experience and training factors, the low-income schools of the city would receive most of the more experienced teachers. Because of the number of experienced teachers needed in the low-income schools, the FA Index for this function would probably fall between the current figures for the public-housing sample group and the middle-income control area. Only a slight increase in the public-housing schools would be effected.

This shift could be made only at the expense of the high-income area and assumes that the teachers would accept the transfer without leaving the system. This assumption may not be valid in the light of the current trend of teachers not to remain in the schools in areas such as those represented by the low-income control area.

An additional complication arises in the high-income areas that are left with schools having teachers with less experience than in the past. To the extent that property values are related to the quality of public education in the area, property values might decline in proportion to a decline in the FA Index, thus causing a loss of revenue. This phenomenon has been observed in a number of large cities and appears to be a factor in the stabilization and decline of the property tax base in large cities.

The second largest single factor contributing to a difference in the expenditures between the public-housing sample group and the three control areas was the operation and maintenance of the physical plant. The sample group, having the largest percentage of buildings constructed since 1950, had the lowest FA Index cost. Second lowest was the low-income control area, which had the second highest number of buildings constructed since 1950. The high-income area ranked third both in the FA Index and in percent of construction since 1950, and the highest FA Index cost was in the middle-income control area which had the oldest buildings of any group in the study. A factor which may have had an influence was the number of pupils per building. The larger buildings were in the areas having the lowest FA Index Cost.

Special education premiums had the third largest range of all functions itemized on the FA Index. There was relatively little difference between groups other than between the middle-income control group and the others. Because there were only eight special education classes in the middle-income area and only two in the high-income area, no detailed comparison of salary components for this group of teachers was made in this study.

Differences in administrative costs appear to be the result of building size and the longevity of the principal. Costs of auxiliary teachers follow a pattern between groups that is similar to administration.

Materials and supplies have the smallest variances of any item analyzed. There is no significant difference between groups for this item.

Noneducational services, which include food service and community services, have the highest FA Index figure in the middle-income control group. Services of this type for the low-income schools in both the sample and the control groups are very similar in cost per basic teaching unit. No definite answer was found to explain the proportionately higher cost in the middle-income area, but a reasonable hypothesis would be that the density factor and the income bracket may operate with more effect here than in the other items.

The total cost figures, excluding capital outlay, do not tell the complete story although they do give some indication of where the money is going on a geographic basis. A so-called equitable redistribution of funds based on a variation of total cost alone would definitely not be equitable because of the various fixed cost differentials due mainly to density. The density factor allows for larger buildings requiring less overhead for plant operation and administration.

The rapid movement of population into certain areas of a city requires large capital outlays. However, these new buildings require less money to operate and maintain.

The analysis above indicates that any equalization of expenditures on a per-pupil unit or a teaching unit basis would *not* result in equalized educational provisions for all pupils.

Efficiency

To many professional educators, efficient operation of schools is the ability to get the most and the best teachers possible while keeping all other expenditures to a minimum. A percentage distribution of the FA Index, Table 3, presents an efficiency allocation by which the various groups of schools can be compared.

If all teachers are equal except for their experience and training, the group allocating the largest proportion of funds to obtain the most experience and training could be said to be the most efficient. At the same time the most efficient group would be allocating the smallest proportion of funds to overhead costs. The following list ranks the sample group and the three control areas in order of efficiency and

TABLE 3.—PERCENTAGE DISTRIBUTION OF BUDGETED EXPENDITURES PER $1,000 OF BASIC TEACHER COST FOR THE SAMPLE GROUP AND THE CONTROL AREAS

Function	Sample group	Control areas		
	Public housing	Low income	Middle income	High income
1	2	3	4	5
INSTRUCTIONAL SERVICES	38.8%	26.7%	28.7%	42.0%
SUPPORTING SERVICES	61.0	73.0	70.6	58.0
Administration	17.8	21.2	13.4	13.5
Auxiliary services	9.3	10.9	7.3	7.8
Materials and supplies	5.2	5.4	3.1	3.0
Plant operations	28.7	35.5	46.8	33.7
NONEDUCATIONAL SERVICES	0.2	0.3	0.7	...
Total budgeted expenditures for services per $1,000 basic teacher expenditure	100.0%	100.0%	100.0%	100.0%

gives the percent of FA Index cost devoted to the functional areas:

Group	*Instructional services*	*Supporting services*	*Noneducational services*
High-income area	42.0	58.0	—
Public housing sample	38.8	61.0	0.2
Middle-income area	28.7	70.6	0.7
Low-income area	26.7	73.0	0.3

This type of efficiency analysis considers the *difference* in teachers' costs rather than the similarities of expenditures.

Revenues

Boards of education rely heavily, and in Chicago entirely, upon the property tax as a source of local income. The public schools in large cities must share a larger proportion of local revenues with other governmental units than smaller urban places and rural areas, thereby leaving much less of the property tax dollar for public education purposes. For this reason, even though the city taxpayer actually pays higher taxes than his suburban neighbors, the public schools in the city are getting fewer dollars per taxpayer than the suburban schools.

Another important factor is that there is a higher percentage of low-income families in large cities living on very low-revenue producing properties. In addition, the large number of public housing units constructed almost entirely in the large cities contribute relatively little to pay the cost of education for the tens of thousands of pupils they send to the public schools.

In Chicago at the time data were collected for this study, only 1.5 percent of the total Board of Education budget was coming from federal sources and just 23.5 percent was from the state of Illinois. Thus, the major portion of money for public education came from the local taxpayer.

The Chicago Housing Authority contributed as payment in lieu of taxes to the Board of Education what amounted to only 13 dollars per CHA resident pupil. The local property tax netted the public schools $459 per pupil, exclusive of pupils residing in public housing units. This amounted to a difference of $446 per pupil for each of the 54,244 pupils who live in CHA public housing projects. If the local taxpayer were to increase his taxes in order to raise the $446 difference for these pupils, it would require a 26-cent increase in the tax rate per $100 of the assessed valuation. This would raise the Board of Education tax rate from $2.26 to $2.52 per $100 of assessed valuation, an increase of more than 10 percent.

Conclusions

This study has shown the financial impact upon communities that must provide public education for a large concentration of low-income families. In some instances federal policies assist in alleviating the burdens imposed upon a community by the concentration of the poor that has been intensified in recent years. In other cases federal policies have aided in concentrating large numbers of poor families in certain areas, particularly in the case of public housing which has been centered largely in the central cities of our nation's metropolitan areas.

It is generally agreed that education is the best program for improving unemployability and for eliminating dependence and poverty. This study has examined the financial effort of the Chicago Board of Education to equalize the educational opportunity of all pupils in the city's public schools. The very small variation between the number of pupils per teacher and also between the number of professionals per 1,000 pupils demonstrates that a major effort is being made in this direction.

The fact that the teachers themselves do not desire to teach in low-income areas where there is an unusually high density of children of school age is reflected in the high number of beginning teachers and teachers with few years of teaching experience to be found in the low-income areas. It is to the credit of the public-housing program, however, that more teachers remain in schools serving predominantly public-housing pupils than in other low-income area schools.

Buildings which require large amounts of capital must be provided to house the increasing enrollments in the low-income areas of the central cities. As public-housing projects are constructed in these areas, the resulting demand for buildings tends to establish priorities in the public-housing areas. At the same time the city is called upon not only to support building programs for schools and public housing, but also a number of other local governmental capital improvement programs. This study did not dwell upon this phase of the problem, but it is of prime importance.

The federal government has acknowledged a responsibility in providing educational services for residents of public housing by way of the in lieu of tax payments. Such payments as these would not constitute a solution to the fiscal problem of educating children in public housing, but they would offer relief to the local tax base of large city school districts. The long-range solution to the problem is to find adequate fiscal support of operating expenses and capital outlay.

Financial Characteristics of High-Expenditure Districts in New York State

Lloyd L. Hogan

ONE OF THE MOST impressive facts concerning public-school finance in New York State is the tremendously wide variation in operating expenditures among school districts. During the 1965-66 school year these expenditures on a per-pupil basis ranged from $500 to $1,200. This fact should be of extreme importance to students of public-school finance since New York State distributes state aid under a fairly strong equalization formula. It should be noted parenthetically, however, that the distribution formula has no built-in devices to discourage the high-expenditure districts, while it provides good stimulus to the low-expenditure districts to move upward toward a specified statutory expenditure level.

Major Factors Affecting Expenditures

A series of studies over the past three years attempted to discover the major factors affecting expenditure levels and the specific effects of these factors as measured by the empirical data. The data indicated statistically significant effects of the joint operation of five factors in describing variations in expenditures among school districts. These are:

1. The number of pupils
2. The level of local fiscal resources
3. Location inside or outside the New York City Metropolitan Area
4. Small district size
5. Location in one of the six largest cities.

These factors jointly describe approximately 96 percent of the variation in gross dollar expenditures among the major districts. If expenditures are converted to a per-pupil basis, however, approximately 70 percent of the variation can be accounted for by the remaining four factors.

The Number of Pupils

The number of pupils to be educated constitutes one of the most important factors in determining the operating expenditures of school districts. This factor is obviously an index of the major element of "need" facing districts. Based on 1964-65 data, on the average for the state as

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a whole, each pupil accounted for $544 of operating expenditures when the effects of the other four factors mentioned above were held constant. Attempts to group pupils into various grade levels proved to be of no statistical significance.

The Level of Local Taxable Resources

The local fiscal resources available to the districts also constitute a very important factor in determining the level of operating expenditures. This factor is the major economic "opportunity" element which provides the basis for local discretion and which, given the state aid mechanism, places an upper limit on what the districts can spend. Since personal income data are not available on a school district basis in New York State, the local real property tax base was used as a measure of local fiscal ability. Based on 1964-65 data, on the average for the state as a whole, this factor accounted for an amount of operating expenditures equal to 0.5 percent of the local property tax base when the effects of the other factors were held constant.

Location Inside or Outside the New York City Metropolitan Area

It is well known that expenditure levels in the New York City Metropolitan Area are much higher than those in the rest of the state. The statistical significance of such differences in expenditures have been well established in our studies. Based on 1964-65 data and considering districts with the same amount of property tax base and the same number of pupils, districts in the New York City Metropolitan Area spent approximately $95 per pupil plus 0.36 percent of the property tax base more than their counterparts in the rest of the state.

Small District Size

While small size was not found to be statistically significant in the studies, nevertheless on the average these districts constantly spent above the levels of districts outside the New York City Metropolitan Area. It should be emphasized, however, that the spending patterns of these districts are much more variable than those of any other group of districts studied. A good part of the erratic expenditure patterns of these districts can be accounted for by those which do not operate a full K-12 program. In our studies, based on visual observation of the data, we have arbitrarily set an upper limit of 1,000 pupils as a definition of small size, no matter where the district is situated in the state.

Location in One of the Six Largest Cities

Generally speaking, expenditure levels of the school districts in the six largest cities of the state are well below the average for districts similarly situated and with the same amount of local property tax base. The one exception is Rochester. Based on 1965-66 data, for example, these districts were spending below their expected levels as follows:

Buffalo	$179
Syracuse	81
Yonkers	268
Albany	65
New York City	108

Rochester reverses this pattern by spending $73 per pupil above its expected level. It might be indicated, however, that over the last few years the per-pupil expenditures of New York City have been increasing quite

TABLE 1.—AVERAGE OPERATING EXPENSE PER PUPIL AT SELECTED LEVELS OF LOCAL RESOURCES FOR FOUR CLASSES OF SCHOOL DISTRICTS IN NEW YORK STATE, 1963-64

School district class	Level of local resources based on full value of taxable real property per pupil						Number of districts
	0– $12,000	$12,000– 20,000	$20,000– 28,000	$28,000– 36,000	$36,000– 44,000	Over $44,000	
1	2	3	4	5	6	7	8
Downstate districts................	...	$627	$690	$735	$790	$898	142
Small districts....................	$534	570	583	664	628	798	239
Upstate districts..................	521	530	559	614	689	635	359
Six largest cities							
Buffalo........................				458			1
Syracuse.......................				531			1
Yonkers........................					527		1
Rochester......................					659		1
Albany.........................					570		1
New York City..................					649		1
Number of districts...............	140	271	144	74	48	69	746

rapidly. If this pace continues over the next five years, it is conceivable that New York City could take its place among the districts of its region.

It appears from what we have just said that large size is associated with low spending. However, the low expenditure levels of these districts may well be associated with highly specialized circumstances such as constitutional tax limits, fiscal dependence on the municipality in which it is situated, and methods of treatment in the state aid distribution formulas.

Tables 1, 2, and 3 summarize the pattern of variation in per-pupil expenditures in relation to local fiscal resources and location among the major districts of New York State for three school years.

Method of the Study

From what has been said above it is obvious that a profile of a high per-

TABLE 2.—AVERAGE OPERATING EXPENSE PER PUPIL AT SELECTED LEVELS OF LOCAL RESOURCES FOR FOUR CLASSES OF SCHOOL DISTRICTS IN NEW YORK STATE, 1964-65

School district class	Level of local resources based on full value of taxable real property per pupil						Number of districts
	0– $12,000	$12,000– 20,000	$20,000– 28,000	$28,000– 36,000	$36,000– 44,000	Over $44,000	
1	2	3	4	5	6	7	8
Downstate districts................	...	$657	$728	$789	$863	$947	141
Small districts....................	$564	584	610	659	698	838	200
Upstate districts..................	543	563	589	652	720	707	367
Six largest cities							
Buffalo........................				491			1
Syracuse.......................				556			1
Yonkers........................					550		1
Rochester......................					699		1
Albany.........................					615		1
New York City..................					712		1
Number of districts...............	135	267	148	67	43	54	714

pupil expenditure district in New York State is a rather simple and direct one. Such a district is one possessing either one or both of the following characteristics:

1. High levels of local fiscal resources, no matter where located in the state, and no matter what size
2. Location in the New York City Metropolitan Area, but not in New York City.

It follows that a profile of a low-expenditure district would be a district with one or both of the following characteristics:

1. Location outside the New York City Metropolitan Area with low levels of fiscal resources
2. Location in one of the six largest cities (except Rochester).

For purposes of this study, however, a different approach was used to define high- and low-expenditure districts. For each of three groups of districts—downstate (New York City Metropolitan Area), upstate, and small districts—a regression of operating expenditures per pupil on the local property tax base was computed. Any district whose actual expenditures fell more than two standard errors above its expected expenditure level was defined as a high-expenditure district. Similarly, any district whose actual expenditures fell more than two standard errors below its expected level was defined as a low-expenditure district.

The expenditures of these districts were then related by a simple comparison with each of a number of characteristics to discover whether there was any systematic association between such characteristics and the level of spending. This method is equivalent to comparing the residuals from the regression equation with some characteristic which does not appear explicitly in the regression as an independent variable. While there are some dangers in resorting to simple observations of this kind, it is, nevertheless, a device for sorting out possible significant candidates for future study.

Out of a total of 737 districts studied, the six largest cities were deliberately excluded. In addition, since we were studying those districts at

TABLE 3.—AVERAGE OPERATING EXPENSE PER PUPIL AT SELECTED LEVELS OF LOCAL RESOURCES FOR FOUR CLASSES OF SCHOOL DISTRICTS IN NEW YORK STATE, 1965-66

School district class	Level of local resources based on full value of taxable real property per pupil						Number of districts
	0–$12,000	$12,000–20,000	$20,000–28,000	$28,000–36,000	$36,000–44,000	Over $44,000	
1	2	3	4	5	6	7	8
Downstate districts	...	$707	$762	$823	$892	$978	140
Small districts	$598	611	635	679	713	872	226
Upstate districts	582	598	618	690	712	719	365
Six largest cities							
Buffalo				511			1
Syracuse				609			1
Yonkers					624		1
Rochester					785		1
Albany					647		1
New York City					784		1
Number of districts	135	265	144	75	44	74	737

TABLE 4.—NUMBER OF DISTRICTS IN THE SAMPLE BASED ON THREE REGIONAL CLASSIFICATIONS AND TWO EXPENDITURE LEVELS

Regional classification	Expenditure level		Total
	High	Low	
1	2	3	4
Downstate	10	6	16
Upstate	17	8	25
Small	13	11	24
Total	40	25	65

the two tails of the conditional distribution of expenditures (given the level of local resources), an attempt was made to eliminate those with known peculiar characteristics. As such, we eliminated all districts that did not operate a full K-12 program and all districts with more than $90,000 per-pupil local property tax base. Any district that receives an unusual amount of federal aid was likewise eliminated because of the special way in which operation expenditures are defined in New York State. Those remaining for study were 40 high-expenditure districts and 25 low-expenditure districts. Table 4 shows the distribution of these districts among three regional classes.

Some of the factors which were studied are shown in Tables 5 and 6. In addition, Table 7 displays some material on achievement test scores which were considered in the analysis.

Expenditure Determinants

It should be pointed out that our definition of high and low expenditures is not necessarily based on the absolute level of spending. It is conceivable that within a group of districts we could have one classified as a low-expenditure district yet having a higher absolute level of expenditure than one classified as a high-expenditure district. Among the small districts, for example, Gilboa spends $763 per pupil and is classified as a low-expenditure district, and Georgetown spends $723 and is classified as a high-expenditure district. The key here is that Gilboa has a property tax base of $45,000 compared with Georgetown's tax base of $9,000. Georgetown is spending above the level expected on a $9,000 tax base, and Gilboa is spending below the level expected on a $45,000 tax base. In the other two groups of districts, however, all of the high-expenditure districts have absolute expenditure levels above those classified as low-expenditure districts.

The following paragraphs discuss the association between expenditure levels and various factors which may affect such expenditures.

Property Tax Base

From the manner in which we have distinguished between high- and low-expenditure districts there is no reason to suppose that either type would be concentrated in a specific area of local property values. As a matter of fact they should theoretically occur at all points along the full range of the distribution of property values, whether they are high or low spenders. This proposition is fairly well borne out by the data. However, there are some important exceptions. Among the down-state districts the high-expenditure districts have property values which range between the 75th and the 90th percentiles in the state-wide distribution. Likewise, among the upstate districts, the low-expenditure districts have property values which range from near the median to the 90th percentile in the state-wide distribution. For the

TABLE 5.—SELECTED DATA FOR THREE GROUPS OF PUBLIC SCHOOL DISTRICTS CLASSIFIED BY HIGH AND LOW EXPENDITURE LEVELS NEW YORK STATE, 1965-66

School district	Number of pupils	Property value per pupil	Operating expense per pupil	Local tax levy per pupil	Budget percentage			Prof. staff/1000 pupils	Average teacher salary	Percent dropouts to graduates	Percent 12th to 9th grade	Percent post-high-school education
					Teacher salaries	Supplies	Auxiliary services					
1	2	3	4	5	6	7	8	9	10	11	12	13
					Group I: Downstate districts							
High expenditure												
28	3,766	$31,389	$ 993	$ 733	56.2%	4.7%	4.9%	63.0	$ 8,911	6%	102%	75%
66	1,352	32,418	964	811	51.2	4.4	6.7	60.6	9,026	1	84	95
28	4,835	34,159	955	634	55.1	3.2	5.7	54.8	8,363	7	83	70
66	2,684	34,430	990	822	52.1	4.3	8.4	63.4	8,591	7	93	65
28	4,729	39,982	1,196	1,011	46.5	3.5	5.3	65.1	9,348	2	89	86
66	1,691	43,658	994	898	54.7	6.3	8.3	63.3	8,588	2	115	75
66	2,505	43,966	1,014	919	55.6	5.3	6.2	63.5	9,241	10	84	77
58	1,996	46,513	1,079	1,120	57.4	5.1	4.7	66.6	9,440	1	73	85
28	10,934	49,812	1,074	1,023	53.1	7.2	12.9	59.4	10,465	3	104	85
66	5,298	56,307	1,091	999	53.1	4.8	7.1	61.9	9,796	2	91	100
Low expenditure												
58	1,127	22,746	663	323	58.6	4.7	5.1	49.7	8,091	26	68	87
58	1,669	35,772	531	528	69.7	7.0	5.2	53.3	6,926	12	76	83
58	3,800	37,576	610	472	59.3	3.9	4.3	46.3	7,665	34	61	47
44	2,371	39,615	809	735	56.4	4.3	6.6	54.9	8,374	8	88	37
58	1,786	69,451	773	704	57.4	5.0	4.3	49.8	9,189	20	93	71
58	1,230	75,035	830	839	55.7	5.4	5.4	53.7	9,178	22	83	61
					Group II: Upstate districts							
High expenditure												
31	2,838	12,457	702	253	56.1	4.1	5.6	53.6	7,407	14	82	55
33	3,583	13,418	691	278	57.4	5.1	5.1	53.9	7,406	10	93	77
03	5,071	13,796	820	246	55.1	5.9	6.3	53.2	7,752	1	98	70
09	1,138	14,043	732	231	55.4	4.4	6.1	57.1	6,737	24	53	53
44	1,460	15,390	725	216	54.3	5.9	3.2	52.0	6,807	21	70	31
40	2,094	15,691	701	243	56.1	7.1	5.0	53.5	6,788	22	63	53
03	3,834	18,199	719	311	53.4	4.5	5.5	53.2	6,999	6	96	31
22	6,782	18,690	763	299	51.7	4.8	5.0	50.2	6,997	18	89	59
44	3,250	23,681	774	399	51.6	5.2	5.2	54.4	7,460	10	72	67
01	2,476	24,156	719	423	57.4	3.0	5.5	54.5	8,184	21	147	50
61	8,196	25,180	741	434	50.7	3.7	4.7	54.9	7,399	7	101	59
26	3,073	26,147	746	497	56.3	4.4	4.9	51.9	8,086	4	96	77
53	4,648	28,011	783	533	57.3	3.4	5.5	52.8	8,884	3	101	92
59	1,961	32,872	783	594	52.6	6.9	5.9	54.6	8,345	16	89	74
48	1,973	33,023	829	706	57.1	4.4	7.8	59.3	8,171	16	79	53
14	1,531	33,377	913	499	43.3	3.2	6.1	50.9	7,878	6	67	72
59	1,327	33,570	893	697	54.3	3.0	4.8	53.3	8,196	7	101	76

Low expenditures												
33	2,044	17,038	493	173	36.9	3.6	3.4	43.0	7,131	17	84	57
24	1,707	19,639	488	232	37.7	3.4	3.0	44.3	6,768	4	89	69
16	6,323	20,934	642	324	33.6	4.8	3.1	45.4	6,879	14	81	37
18	1,733	23,836	309	221	37.6	4.3	3.4	46.1	6,633	11	80	31
14	6,143	32,836	368	444	33.6	6.0	7.1	40.3	6,634	10	82	63
14	22,283	33,463	634	416	34.3	3.3	3.8	44.1	7,349	9	98	63
10	3,879	40,719	374	224	33.7	3.3	3.4	47.9	6,617	23	79	33
14	2,771	31,319	399	339	31.2	3.8	6.3	46.9	6,329	24	84	33
					Group III. Small districts							
High expenditure												
23	344	9,223	723	168	39.5	6.8	1.3	65.6	6,556	31	100	92
33	383	10,307	697	138	34.3	6.3	3.9	60.0	6,639	3	90	69
44	336	13,378	711	393	39.8	3.1	4.0	73.0	3,967	37	44	27
39	491	20,306	781	348	38.3	4.9	1.6	71.3	6,390	14	80	69
09	319	21,321	736	323	37.8	3.6	8.1	69.0	6,123	6	90	73
13	337	26,111	899	933	31.8	4.3	7.1	73.9	6,300	7	61	37
13	338	30,717	817	698	40.4	3.8	1.3	67.2	3,876	38	67	72
13	307	33,603	873	372	32.8	4.3	4.1	77.3	3,960	...	82	67
13	889	34,713	839	748	30.7	3.9	4.8	34.0	7,872	13	60	63
63	177	39,000	920	743	39.5	3.0	3.3	84.7	6,433	...	108	43
30	376	42,293	829	380	34.9	4.3	3.8	30.4	7,333	...	63	33
44	399	45,174	1,012	786	33.6	3.8	3.2	70.3	7,717	...	79	38
30	317	31,187	1,321	1,093	33.5	7.4	1.0	87.6	7,214	13	63	77
Low expenditure												
23	404	6,038	488	33	53.9	4.2	2.2	42.1	6,483	18	96	36
37	941	10,021	487	103	60.3	3.6	3.8	42.3	6,908	7	61	38
17	600	14,370	307	233	33.4	3.3	1.0	43.0	6,013	33	103	61
09	871	32,609	313	267	37.1	3.1	6.4	43.6	6,739	26	83	74
38	903	42,667	371	460	39.1	6.0	4.4	46.3	7,232	8	88	64
39	437	42,991	331	433	37.9	3.8	4.6	48.1	6,624	40	71	68
38	422	44,833	730	399	39.8	8.3	1.3	34.3	8,008	...	64	71
34	313	45,014	763	621	33.9	6.4	6.2	60.4	6,800	39	79	39
63	920	32,737	730	623	48.0	3.9	4.9	36.3	7,042	7	80	77
38	763	38,030	637	646	39.1	6.8	4.0	31.1	7,399	10	91	72
31	376	70,699	706	739	34.0	3.3	3.4	60.8	6,301	13	33	43

TABLE 6.—RANGE OF THE DISTRIBUTION OF SELECTED CHARACTERISTICS AMONG HIGH AND LOW EXPENDITURE DISTRICTS IN NEW YORK STATE, 1965-66

Characteristic	Expenditure level	Type of district		
		Downstate	Upstate	Small
1	2	3	4	5
Tax rate	High	1.8-2.4%	1.3-2.0%	1.2-3.5%
	Low	0.9-1.4	0.7-1.4	0.9-1.4
Tax levy per pupil	High	$634-1,120	$246-706	$138-1,095
	Low	323-839	175-559	53-739
Teacher salary percentage	High	47-57%	43-57%	48-60%
	Low	56-70	55-58	48-60
Supply and material percentage	High	3-8%	3-7%	3-8%
	Low	4-7	4-7	4-9
Auxiliary services percentage	High	5-13%	3-8%	1-8%
	Low	4-7	4-7	1-6
Professional staff per 1,000 pupils	High	55-67	50-59	50-85
	Low	46-55	40-48	42-61
Average teacher salary	High	$8,400-10,500	$6,700-8,900	$5,900-7,900
	Low	6,900-9,200	6,600-7,500	6,000-8,000

other group, practically the entire range of the state-wide distribution is spanned.

In sum, while there are exceptions to the rule, it may nevertheless be stated that the level of spending is linearly related to local resources. Once having removed its effects by linear regression, no further account need be taken of it.

Local Taxes

The local property tax rates of the high-spending districts are consistently higher than those of the low-spending districts. Moreover, there is very little overlap in the rates among the high and low spenders. For example, among the downstate districts, the low-expenditure districts have tax rates ranging from 0.9 percent to 1.4 percent; the high-expenditure districts range from 1.8 percent to 2.4 percent. The same general pattern is true for the other two groups of districts, except that there is a small overlap in the range of variation in those cases. High tax rates among high-expenditure districts and low tax rates among low-expenditure districts necessarily follow from the way in which we have defined high and low expenditures.

The tax levy per pupil is also consistently higher among the high-expenditure districts than among the low-expenditure districts for all three groups of districts studied. In this case, however, there is considerable overlap between the two groups. For example, among the upstate districts the tax levy per pupil ranges from $246 to $706 for the high-expenditure districts; it ranges between $175 and $559 for the low-expenditure districts. The reason for the lack of a clear-cut distinction between the two groups on this measure is that some districts with high property values are classified among the low-expenditure districts. The absolute level of their tax levies will therefore follow the same pattern as the absolute level of their expenditures.

Distribution of Budget Expenditure Categories

Three budget categories were studied to determine whether or not the percentage distribution in the budget was related to expenditure levels. The three categories were teacher salaries, supplies and materials, and auxiliary services. No differences were observed in the percent of the budget devoted to supplies and materials among high- and low-expenditure districts. This was true for all three groups of districts studied. A similar conclusion holds for the percentage distribution of auxiliary services in the budget among high- and low-expenditure districts. One possible exception may be noted. Among the down-state districts the percentage Great Neck devotes to auxiliary services is 13 percent. This appears to be so far out of line with the rest of the data that it could well be in error. If Great Neck is eliminated, the high and low spenders appear to be practically the same on the range of variation in this measure.

The percentage of the budget devoted to teacher salaries, however, presents a somewhat different picture. This percentage covers the identical range among high and low spenders in the small district category. In the other two groups of districts, however, the percentage of the budget devoted to teacher salaries is decidedly smaller among the high-spending districts than among the low-spending districts. For example, this percentage ranges from 47 percent to 57 percent among the high spenders; while it ranges from 56 percent to 70 percent among the low spenders in the downstate districts.

Professional Staffing Ratio

Without a question of doubt the professional staffing ratio is much higher for the high-expenditure districts than for the low-expenditure districts. This is true for all three groups of districts studied. As a matter of fact there is no overlap of this ratio between the high- and low-expenditure groups for the downstate districts and the upstate districts. For example, among the downstate districts the number of professional staff per 1,000 pupils ranges between 50 and 59 for the high-expenditure districts; it ranges between 40 and 48 for the low-expenditure districts. For the small districts there is a

TABLE 7.—RANGE OF SCORES (IN PERCENTILE RANKS) ON SELECTED ACHIEVEMENT TESTS FOR THREE TYPES OF DISTRICTS CLASSIFIED BY HIGH AND LOW EXPENDITURES IN NEW YORK STATE, 1965-66

Type of district	Expenditure level	First-grade readiness	Third grade		Sixth grade		Ninth grade	
			Reading	Arithmetic	Reading	Arithmetic	Reading	Arithmetic
1	2	3	4	5	6	7	8	9
Downstate	High	50-81	50-78	45-77	59-78	58-76	45-82	42-71
	Low	44-66	50-62	45-65	39-56	38-66	45-58	42-53
Upstate	High	37-81	39-78	42-80	47-75	41-78	45-74	42-53
	Low	38-70	48-62	35-68	47-61	41-68	45-58	55-71
Small	High	34-77	39-72	31-80	32-61	38-76	40-74	42-71
	Low	38-85	31-69	31-80	27-61	43-73	40-74	42-71

slight overlap owing primarily to relatively high ratios for some fairly wealthy districts in this group. Undoubtedly, there is some interrelationship between this ratio and the level of local resources.

Teacher Salaries

The data suggest a tendency for teacher salaries to be higher among the high-expenditure districts. There is, however, some overlap in salary levels between the high- and low-expenditure districts. In the case of the small districts the average salary range appears to be exactly the same in both high- and low-expenditure districts.

Other Characteristics

An attempt was made to study nonfinancial characteristics of school districts to determine whether or not there is any relationship between such characteristics and the spending levels. Unfortunately, school district boundaries in New York State generally bear no relationship to municipal boundaries. Therefore, it is almost impossible to convert social and economic data to a form usable on a school district level. We were able, however, to study some educational information on dropouts, percent of graduates pursuing post-high-school education, and achievement test scores.

There appears to be a tendency for the high-expenditure districts to have a smaller proportion of dropouts than the low-expenditure districts. This tendency, however, is somewhat blurred by the great overlap in this ratio between the high- and low-expenditure districts.

It also appears that the high-expenditure districts tend to have a greater proportion of their high-school graduates pursuing post-high-school education. Again, this tendency is blurred by the great overlap in this ratio between the high- and low-expenditure districts.

Recently, the Division of Testing in the New York State Education Department made available to us certain scores on achievement tests covering reading and arithmetic readiness in the first grade, and reading competence and arithmetic competence in the third, sixth, and ninth grades. The median scores for each district were converted to a percentile rank on the state-wide distribution of scores.

A study of the range in scores for the high-expenditure districts compared with the low-expenditure districts reveals some interesting results. First, for the small districts, there appears to be little, if any, difference in the range of scores between the high-expenditure districts and the low-expenditure districts.

Second, for the downstate districts, the sixth-grade reading scores are definitely higher for the high-expenditure districts as compared with the low-expenditure districts. For all of the other tests the scores of the high- and low-expenditure districts overlap so that it is not clear which has the higher scores. However, a general pattern emerges from the distribution of scores on these tests. Typically the lower element of the range is generally the same for both the high- and low-expenditure districts. The low-expenditure districts, however, have a relatively narrow range of scores compared with the high-expenditure districts. This means that the upper element of the range is considerably higher for the high-expenditure districts as compared with the low-expenditure districts. This might be interpreted to mean that the high-expenditure districts are able to achieve (at least for some of their pupils) relatively high scores, while the low-expenditure districts are pretty well limited to the lower ranges of scores.

Third, the same conclusions stated above for the downstate districts generally hold for the upstate districts although the relationships are not as highly pronounced. For these districts the only definitive test result is ninth-grade arithmetic. Here the range of scores for the high-expenditure districts is definitely below that for the low-expenditure districts.

Summary

The characteristics of high-expenditure districts can now be outlined from the results of our analysis. Indeed, the most important characteristic of such districts is

1. A relatively high level of local fiscal resources.

Second in importance to the level of local resources are

2. Location in the New York City Metropolitan Area
3. A relatively high local tax rate for school purposes
4. A relatively high professional staff ratio

Of some importance but certainly not as definitive as the characteristics mentioned above are

5. A relatively small percentage of the budget devoted to teacher salaries
6. A relatively high average teacher salary
7. Achievement test scores for a good portion of the pupils near the top of the state-wide distribution of the scores.

Most of these factors were studied in isolation, and no account was taken of the possible correlations among them. What is required is to study the joint effects of all these variables on changes in expenditure levels. For the time being, however, they provide us with some educated guesses as to the potential factors which determine high expenditures among school districts.

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Financial Problems of Small School Systems

Victor O. Hornbostel

SMALL SCHOOLS, which are likely to be found in small school systems, suffer most from certain deficiencies in their curriculums. Small schools, observed as a whole, do not adequately challenge their brightest students, are very deficient in offerings in occupational education, and do not cope with special education problems. These circumstances exist where cost per student in a high school of 100 students is, on the average, $280 per student more than the cost in a 500-student school. It is in this general framework that we find the problems of financing small school systems.

If revenues for school support were unlimited, many of these difficulties could be remedied without necessarily first effecting other changes. However, the conditions under which these problems developed probably provide some information with which we need to be concerned in planning for the future. These conditions include a limited local tax base. The limits may be the absolute size of the base itself or they may include limitations on levies—usually expressed in rates—that school boards may make. The conditions include, too, a school district structure which intensifies the problems instead of facilitating their solution. In other words, the problems of small school systems have grown in part from this structure which has not adjusted well to new circumstances.

Programs in Small Schools

Within the controlling effect of these structural limits, studies of school curriculums in different sections of the United States highlight similar deficiencies. A recent study of all high schools in 11 Southern states reports an increase in number of subject areas and courses offered as enrollments increase. Table 1 indicates a typical offering of 21 courses in schools with 99 or fewer students enrolled and 34 courses in schools of 250 to 499 students. The findings were similar for high schools of other grade and enrollment categories.

In many of these Southern states, the county is a basic unit of school administration. From this one might reasonably expect that the small-school problem would not exist, but the evidence suggests it does. Similar curriculum deficiencies are evident in states that developed their school administrative structure through small districts.

For example, a recent study of education in Illinois includes considerable

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information on this point. Data in Table 2 from this study suggest that there are substantial gaps in the curriculums of small schools compared with those of large schools.

The same general condition of fewer subjects and course sections and inadequate coverage of special fields is found in Oklahoma. An examination of the curriculum in a high school of 574 students revealed that 57 different subject areas were offered. In a high school of 83 students, 20 subject areas were offered. Both schools were selected at random from size groupings.[1]

TABLE 1.—NUMBER OF COURSES OFFERED IN THE 1962-63 SCHOOL YEAR BY FOUR-YEAR HIGH SCHOOLS

Subject areas	*Modal number*	
	Schools with 99 or fewer enrolled	Schools with 320 to 499 enrolled
1	2	3
English	4	4
Mathematics	3	4
Science	3	4
Social studies	4	5
Foreign language	0	2
Agriculture	1	4
Art	0	0
Business education	3	5
Home economics	2	3
Industrial arts	0	0
Music	0	2
Physical education	1	1
Vocational education	0	0
	21	34

Source:
Adapted from: Jackson, Joe L. *School Size and Program Quality in Southern High Schools.* Nashville: Center for Southern Education Studies, George Peabody College for Teachers, January 1966. p. 28-29.

TABLE 2.—AVERAGE NUMBER OF HIGH-SCHOOL COURSE CREDITS OFFERED IN 1962-63

Subject areas	Schools enrolling under 200 students	Schools enrolling 400–700 students
1	2	3
Language arts	4.3	4.8
Social studies	3.0	4.1
Foreign languages	1.9	4.4
Science	3.5	4.3
Mathematics	4.3	4.7
Business education	4.7	6.9
Homemaking	3.5	3.3
Agriculture	2.4	4.6
Industrial arts	2.5	5.3
Vocational—trades and industry	0.0	0.3
Fine arts—music	1.0	2.8
Fine arts—art	0.0	1.3
Health and physical education	1.2	1.3
	32.3	48.1

Source:
Adapted from: McLure, William P., and others. *Education for the Future of Illinois.* Springfield: Task Force on Education, State of Illinois, December 1966. p. 33.

The foregoing comparisons were of high schools of medium size with high schools of small size. Studies show similar curriculum deficiencies for elementary schools of small size when compared with elementary schools of large size; however, size disadvantages are probably more pronounced for high schools.

It may be argued that this condition does not necessarily need to exist. In a few sections of the United States, where sparsity of school population is likely to continue regardless of district structure, ways are being sought to improve instruction for all children.[2] With resourceful use of modern techniques and media it is likely that much can be done to ameliorate the effects of size. But even so, it is unlikely that most of the problems of small schools and small school systems will be corrected.

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[1] McClurkin, W. D., director. *Oklahoma Public Schools. A Survey Report to the Governor's Advisory Committee on Common School Education.* Nashville: George Peabody College for Teachers, Division of Surveys and Field Services, 1964. Chapter 4, p. 33.

[2] Stutz, Rowan C., and Merrell, Russell G., editors. *Individualizing Instruction in Small Schools.* Western States Small Schools Project. Salt Lake City, Utah: December 1966. 20 p.

Unit Costs in Small Schools

In regard to finance, current theory suggests that the optimum size of a school district from the standpoint of unit costs is found in districts of intermediate size and that loss of economy occurs in both small districts and very large districts. A recent study in the state of Washington reported unit costs of about $400 per student in high-school districts with 1,500 students. At 1,000 students the average unit cost was about $420, at 500 students the average unit cost was about $480, at 250 students the average unit cost was about $550, and at 100 students the average unit cost was over $700.[3]

In the foregoing paragraphs we have not examined the advantages of small schools which are mostly in terms of a smaller ratio of students to staff. Also, we have not examined other disadvantages of small schools. Some evidence is available that small schools are at a disadvantage in quality of staff, in facility to adopt innovations, and in quality of student output. But the information presented is sufficient to illustrate that much needs to be done with small schools. We suggest that the problems of financing small schools may best be examined in terms of their relationship to school district structure.

Status of School District Organization

In terms of numbers much progress has been made in reducing the number of school districts in the United States. In the past decade the reduction was as follows:[4]

School year	*Basic administrative unit*
1956-57	53,197
1961-62	35,676
1966-67	23,335

This reduction is reflected in most of the states. Thus, in Oklahoma there were 4,450 districts in 1946 and two decades later in 1966-67 the number of districts is 994. Even with this reduction, however, district structure remains a serious problem. Its importance is dominated by this observation:[5]

> Need for a comprehensive reorganization of school districts in Oklahoma is well known and undeniable. It presents problems that press for early solution. It may be the paramount problem among a host of others on which an effective frontal attack must be made. Significant progress must be achieved in time to make impacts upon the education of a large portion of the generation now enrolled in Oklahoma public schools.

It is likely that this description is a reasonably accurate portrayal of the districting problem in many other states, particularly in the traditional small-district states.

Since the financial problems of small schools are largely interwoven with the school district structure, there appears to be some justification for placing a financial premium on improved organization. In the paragraphs that follow, some of the elements and categorical aids associated with small school districts are discussed and then an outline of a system with financial premiums is advanced.

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[3] Hanson, Nels W. "The Size-Cost Relationship in Public Schools." *Trends in Financing Public Education.* Proceedings of the Eighth National Conference on School Finance. Washington, D. C.: National Education Association, 1965. p. 125-33.

[4] National Education Association, Research Division. *Estimates of School Statistics, 1966-67.* Research Report 1966-R20. Washington, D. C.: the Association, 1966. p. 6.

[5] McClurkin, *op. cit.*, Chapter 1, p. 28.

Correction for Sparsity

Many school finance systems recognize that higher unit costs are often associated with sparsity of school population, and this may be a factor which should be recognized in determining the education load. The experience of states with corrections for sparsity is that such corrections may inadvertently be designed so that their practical effect over time is to favor small districts financially. This occurs in districts of declining populations where a given number of units must be maintained or where a school district is entitled to continue receiving state aid when it is paying tuition for its students to other school districts at unit costs below what the actual cost is. The net effect of outmoded state support provisions in my state (Oklahoma) is that there is no financial incentive for the more than 500 elementary school districts to reorganize into districts offering or purchasing all the education available to them at what amounts to half price in terms of the local property tax rate.

If the school finance system is neutral in relation to small school systems, that is, if their education load is determined on the same basis as the education load in large school systems, it is still unlikely that any significant district reorganization will take place. If strong leadership from staff in the state department is available, some advance might be made. This observation about leadership might be generalized to all factors in a state school support structure. An ideal structure still requires strong leadership for it to be maximally effective. The strength does not need to be in mandatory power. Leadership can function in an advisory capacity and with permissive power.

Equalization Support

For school district reorganization to be successful, it is essential that there be an adequate state equalization base for all state support allocations. It can be argued whether this should be on the property tax base or on some other financial capacity base. Since most states use the property tax base for allocating state support, I shall restrict my comments to it. Much of our effort that goes into trying to foster and maintain a viable school district system is wasted where the property base remains on assessed valuation. If actual physical equalization of property valuations is not possible, estimated valuations can be made and used for the purpose of allocating state school aids and other state aids to localities. Such valuations should help in eliminating competitive underassessment of property.

Prescriptions for improving the administration of the property tax are widely agreed upon by those who have studied the problem. If we cannot anticipate some progress in this area, we need to identify the search for other measures of financial capacity, or we need to seriously consider adopting a complete state supported and operated system of education. Many of us prefer not to take this step.

Support for Transportation

If we are to encourage school district reorganization, the state should provide for paying the cost of pupil transportation. One way of doing this would be for the state to pay almost all the cost of transportation. The rationale for this approach is that transportation in itself is not an educational function. Thus, centralization of transportation should have no adverse effects on the curriculum. In this view, transportation is a job that needs to be done, and complete central support might be the most efficient way of getting it done.

If the cost of transportation is to be shared between the state and the local district, the state aid allocation to the school district should be on an equalized basis. Some states have found it desirable to include in the transportation allocation formula, cost differentials for sparsity of transported population. For example, in my state the amount allowed for pupil transportation is determined by multiplying the average number of pupils legally transported by the district during the preceding year by an amount per pupil which varies with the number of pupils transported per square mile of area served.

Support for Capital Outlay and Debt Service

School district reorganization should be encouraged by some provision for state assistance with financing needed school buildings. If school districts are of sufficient size and their need for capital improvement has been reasonably uniform, a plan could be developed for aiding debt service at some common level. Such an allowance would need to be on an equalized basis just as other allowances are.

As these different needs for aid are being described, one is soon faced with the problem of whether the state aid program should proceed in the direction of various categorical aids or whether the needs can be combined into a general aid program. If districts are sufficiently large, it becomes more likely that the proportion of a particular need is similar to that in other districts, and then the necessity for distinction among districts disappears. For example, if all districts have about the same proportion of students in high school, a cost differential on this basis for the purpose of allocating aids becomes meaningless. Thus, we should reorganize aid programs from time to time as well as school districts.

A Financial Premium for Reorganized Districts

The major portion of the school finance plan should place a financial premium on the operating budget of adequately organized school districts. Our concept should change from a minimum foundation program to a full program. The basic program would be the program as is. The full program would be the offering in adequately organized districts such as that currently proposed for Illinois:[6]

> (1) breadth and depth of program to meet the needs of all pupils to be served, (2) availability of adequate supportive services to all programs, (3) use of staff in their special fields of educational preparation, (4) size of student population to provide educational programs of sufficient diversity for all age groups, including young children and adults, under conditions that are educationally and economically feasible either entirely within the district or through the regional district, (5) adequate ratio of certificated professional staff to pupil enrollment, (6) adequate preparation and competence of staff, (7) adequate instructional materials and facilities, and (8) geographic conditions that permit reasonable consolidation of schools for greatest educational advantage and highest performance of staff assigned fulltime to one school as well as those staff members serving more than one school.

Two levels of financing could accompany such a proposal. The basic level would continue the current level of financing so that no district would be in worse condition than it now is. The full level would assure a complete program of education for every student. This full level could be expressed in two ways. One way would be a procedure in which the whole budget of school districts would be submitted to the state department of education for approval. If it would not be possible to move to this basis of educational load, the per-student or per-classroom unit cost must be sufficiently high so that the complete program can be purchased by school districts.

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[6] McLure, William P., and others. *Education for the Future of Illinois.* Springfield: Task Force on Education, State of Illinois, December 1966. p. 211.

If the general outline of the foregoing plan would not supply the financial premium needed to encourage reorganization of school districts, it might be necessary to add an amount for reorganization of districts. For example, operating expense aid in reorganized districts in the state of New York is increased 10 percent for a limited number of years.

The local financial contribution rate to this program would be determined on an equalized percentage basis expressed in ways to preserve the incentive for improved school programs. It may become desirable in time to include in these considerations consideration of the demands of other local governments on the local tax base. If one wants to extend the equalization concept, it might be desirable, too, to consider the relative contribution of localities to the state taxes that provide the revenues from which aids are paid.

While this discussion has not included consideration of advantages and disadvantages of intermediate units of school government, brief mention of the intermediate unit needs to be made. If substantial school district reorganization can be stimulated by a combination of financial premiums and state department leadership, the need for the administrative functions traditionally associated with the intermediate unit will largely disappear. However, an educational services function will remain at least for a time because some reorganized districts will still need to buy some education that they cannot provide by themselves.

One of the goals in planning state support systems is to develop a state policy on state aids that does not require change very often. However, this goal promises to remain somewhat elusive because the major elements affecting the policy are changing—the movement of the economy, the change in number and ages of people to be served, and the dynamics of programs. Thus, state policy for financing small school systems and all school systems requires continuing study, evaluation, and revision.

Cost Differentials and District Size in State School Aid

Francis G. Cornell

THE FOLLOWING ANALYSIS is extracted from a study prepared under contract with the New York State Education Department, which had as its focus possible refinement of methods of determining need for operating expenses aid in the distribution of state aid in that state.[1]

Cost Differentials in Measurement of Need

The problem is not a new one, having received considerable attention in the school finance literature, at least since the Mort doctoral thesis of over four decades ago.[2] A half-century ago the low-expenditure, low educational opportunity territory in New York State and in most other states consisted of small school, small district rural areas. It is not surprising that the initial attack on differences in cost per pupil for "equal educational opportunity" dealt with small school districts.

Following Mort's original formulations, New York State has had weightings or corrections which compensate small school districts for presumed higher expenditures because of low pupil-teacher ratios. This district size weighting on the small end of the scale is sometimes mistakenly termed a "sparsity" correction. Over half of the states in the United States have a system of weighting or adjustment of pupil units used in allocation formulas such that small districts receive a cost allowance of this nature.

New York State has experienced a drastic reduction in small common and union free school districts through district reorganization. It is thus to be expected that a cost differential has been introduced for the other end of the size scale—the big cities. This is part of a post-World War II nationwide interest in urban America. It is exemplified by concentrations of effort on urban renewal, poverty programs,

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[1] The author acknowledges the contribution of numerous individuals, including staff of the New York State Legislature, the State Division of the Budget, and various personnel in the State Education Department.

[2] Mort, Paul R. *The Measurement of Educational Need.* Contributions to Education, No. 150. New York: Teachers College, Columbia University, 1924. 84 p.

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the educationally disadvantaged, and improvement of education in the core cities of our metropolitan areas.

Considerable attention has been given to financial needs for school support in large urban areas through the efforts of the Research Council of the Great Cities Program for School Improvement. The arguments are legion for big-city cost allowances or corrections which are presumably strategic in metropolitan centers for excess costs owing to a prevalence of costly programs for vocational and technical education, education of the handicapped, evening schools, adult education, Americanization programs, and expensive educational programs to compensate for the environmental deficiencies of the culturally disadvantaged. Another major consideration in school finance, not a subject of this paper, is "municipal overburden" or the competition of the local school dollar for increasing per-capita costs of municipal government in high population density areas.

Thus, in New York State there is a "size correction," a small district or "sparsity" correction on the small end of the scale, and a large city or "density" correction on the large end of the scale.

The New York State Aid Plan

The present system of state aid to New York State school districts is basically a general aid plan. Aside from relatively small amounts of special aids, school districts since 1962 have received state aid on the principle of state-local sharing of all approved operating costs up to a ceiling. It is computed in three major parts: operating expenses aid, building aid, and transportation aid. However, the separate computations are used merely as means of deriving a total general allocation to districts and are not earmarked.

The major component of this general allocation of state aid is the "operating expenses aid" component. The material in this paper concerns primarily this component and adjustments made to it. Operating expenses aid is calculated by multiplying approved operating expenses of a district by the district's "aid ratio." The "aid ratio" introduces equalization into the apportionment since the greater the property valuation of the district, the lower the ratio, and hence the lower the proportion of sharing by the state. The "aid ratio" is 1.000 less .51 times the ratio of a district's full property valuation per WADA to the state average valuation per WADA.[3]

The New York State school finance plan is a modification of the conventional "equalization model" for state school aid providing for each school district an amount sometimes known as a "foundation program," a specified number of dollars per pupil, times the number of pupil units, less a rate on local property valuation. As it stands now in New York State, the foundation program is the average expenditure per pupil unit in the district up to $660. Since a majority of the large school districts are now spending the $660 ceiling per WADA, the operating expenses aid is thus in great part a $660 foundation program plan.

The foregoing is pertinent in the present analysis since variations, allowances, adjustments, or corrections can be viewed as justifiable modifications of one or more of the following factors:[4]

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[3] Weighted pupil in average daily attendance computed as 1.00 for pupils in grades 1-6, .50 for half-day kindergarten, and 1.25 for grades 7-12.

[4] Cornell, Francis G. "Grant-in-Aid Apportionment Formulas." *Journal of the American Statistical Association* 42: 92-104; March 1947.

The cost of the program

a. The number of dollars to be allowed per pupil unit, the unit cost of the program supported
b. The number of units of need (pupil units)

The local contribution

c. The local tax effort as a rate on local valuation
d. The amount of local valuation used as a measure of local taxpaying ability.

The Size Correction

Of special interest here is the "size correction aid" which, since 1962-63, has increased in amounts from $21.2 million to an estimated $88.0 million in 1966-67. For 1965-66 the percent of operating expenses or percent of operating expenses aid, determined by the size correction, varied among school districts from less than 1.0 percent to 17.5 percent. The two major provisions in the computation of size correction aid in that year were as follows:

1. For districts under 125,000 population: 10 percent of operating expenses aid per pupil for the first 1,250 pupils (but not to exceed $60 per such pupil).
2. For the six city school districts having 125,000 or more population: 17.5 percent of operating expenses aid plus growth aid, an allowance permitting current ADA statistics if greater than the previous year's ADA.

Most districts receive "size correction aid" under provision (1) above. The original intent of this aid was apparently that of adjusting for "sparsity" or the added costs of operating small school districts. The correction amounted to 10 percent in districts with 1,250 and fewer pupils, but declined in percent rapidly as district size increased. A district with 5,000 WADA would receive 2.5 percent more aid, a district of 10,000, 1.25 percent, and large districts with less than 125,000 population negligible percentages of "size correction aid."

Provision (2) above is a blanket 17.5 percent allowance for presumed excess costs attributable to large city or large district operations due to characteristics of population density or other complex conditions related to size.

Thus, the correction varies from 10 percent at the small district end, dips to negligible amounts at the mid-range of district size and ends at 17.5 percent for large city districts. This is shown graphically in the accompanying chart.

The tenability of this arrangement is easily questioned as the 1965-66 correction abruptly jumps to 17.5 percent for the six largest city districts. This includes Albany which had only 12,999 WADA in 1964-65, a WADA exceeded that year by 10 or more school districts, not among the big six, and whose corrections amounted to less than 1 percent.

The Correction for 1966-67

On the assumption that large size and the 17.5 percent adjustment is defensible and that size itself is an acceptable indicator of need for adjustments of costs based upon simple WADA, one would expect some degree of graduation in the correction for large districts not in the big six. There is every reason to expect some requirement of this nature in those districts not as large as New York City, with over one million WADA or even Buffalo with 73,000 WADA, and which approach in size such city systems as Rochester, Syracuse, and Yonkers. It was at this end of the size correction scale that an adjustment was sought in last year's legislative session.

The result is shown graphically in the accompanying chart. In the formula for this year, 1966-67, all districts over 1,250 WADA and not among the big six, will receive more size correction aid under provision (1), particularly those over 8,000 WADA. The 17.5 percent correction for the six cities is unchanged.

TABLE 1.—NEW YORK STATE SIZE CORRECTION, 1965-66 AND 1966-67

WADA	Percent correction	
	1965-66	1966-67
1	2	3
20,000	0.62%	4.35%
19,000	0.66	4.26
18,000	0.69	4.17
17,000	0.74	4.06
16,000	0.78	3.94
15,000	0.83	3.80
14,000	0.89	3.64
13,000	0.96	3.46
12,000	1.04	3.25
11,000	1.14	3.00
10,000	1.25	2.70
9,500	1.32	2.53
9,000	1.39	2.33
8,500	1.47	2.12
8,000	1.56	1.88
7,500	1.67	2.00
7,000	1.79	2.14
6,500	1.92	2.31
6,000	2.08	2.50
5,500	2.27	2.73
5,000	2.50	3.00
4,500	2.78	3.33
4,000	3.13	3.75
3,500	3.57	4.29
3,000	4.17	5.00
2,500	5.00	6.00
2,000	6.25	7.50
1,500	8.33	10.00
1,250	10.00	10.00
1,000	10.00	10.00
500	10.00	10.00

The change was effected by an expedient of first applying the adjustment of 10 percent of operating expenses aid per pupil to the first 1,500 (but not to exceed $66 per pupil) instead of 1,250 WADA, and second, in districts over 8,000 WADA, allowing also 10 percent for 60 percent of the excess over 8,000 pupils.

The percent correction for districts of various sizes other than the six large cities is shown in Table 1.

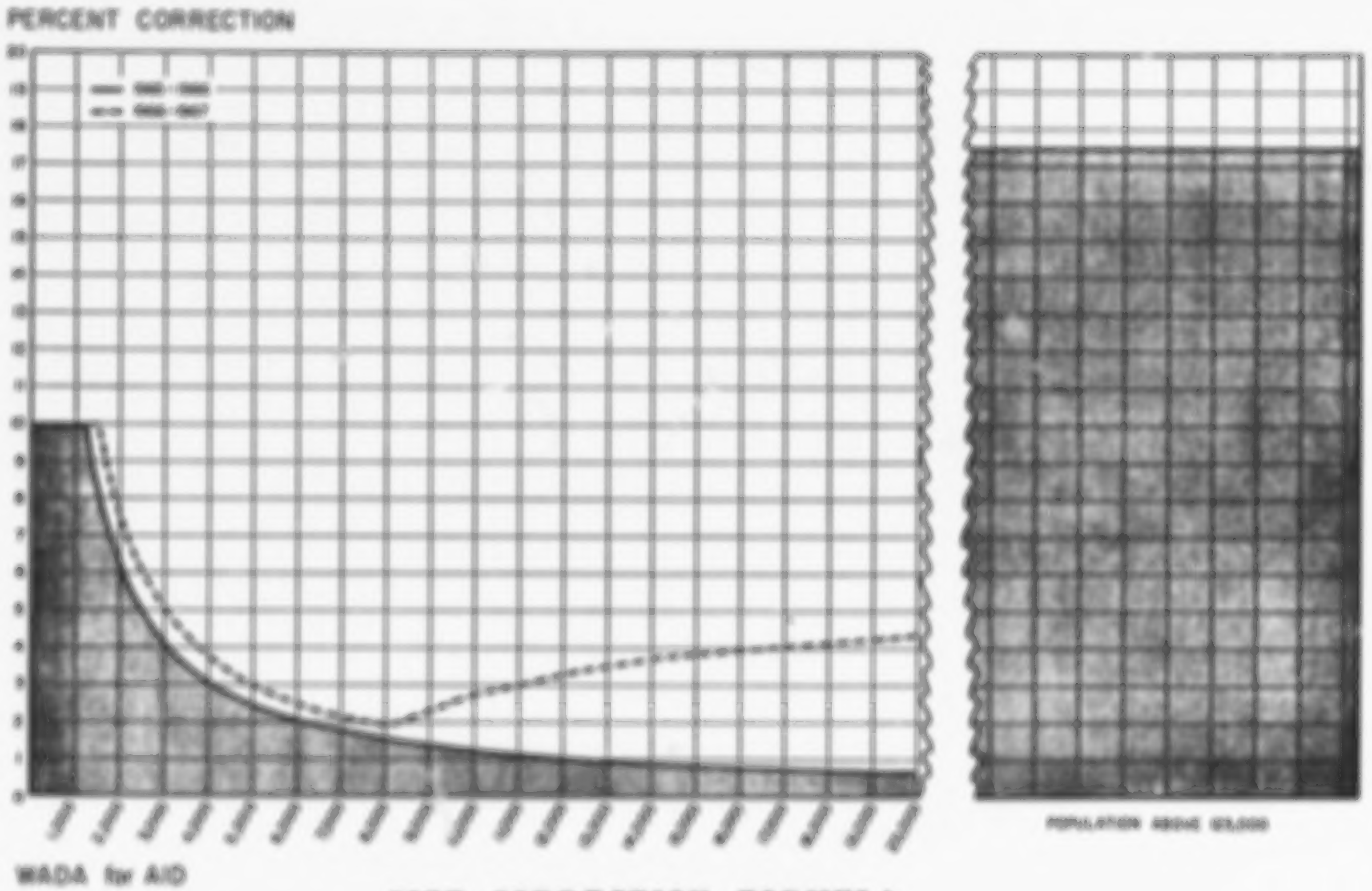
The Approach of the Analysis

The objective of this analysis is conceptually oriented to adjustments in "the cost of the program." That is to say, what adjustments, if any, may be justified because of unique elements, beyond the control of local school districts, which entail excess education costs. In other words, if it is determined that in a school district $660 worth of education will cost 10 percent more than in the typical or average district, the state would consider sharing a $720 program in that district.

On the other hand, if the district is given a 10-percent additional allowance or correction and there is no real 10-percent cost differential owing to considerations in the district, the state has in effect given it a premium by requiring of it an inequitably lower rate of local contribution to the shared program.

A major objective of the study was an attempt to identify elements of differential costs presumed to be pertinent in financing local school programs, to find measures or indexes of such elements of school costs and to evaluate them as possible means of modifying the system of state aid allocations.

This search for school costs factors was accomplished by four major steps. First was a review of existing research on school costs derived from New York



SIZE CORRECTION FORMULA

EDUCATIONAL RESEARCH SERVICES, INC.

State and other states.[3] Second was a statistical analysis of data derived from 42 of the large school districts in the State. These were the 42 districts that include all of the large cities and other areas listed as urban areas by the U. S. Bureau of the Census. The third phase was an application of selected experimental measures as derived from step two to all districts of 5,000 WADA or more, and finally an application of experimental measures to all districts including districts under 2,000 WADA by means of estimates from a sample of such districts.

U. S. Census Measures

One source of statistics that yields information about social and economic conditions in school districts is U. S. Census. Studies made with particular reference to problems in large cities have shown that U. S. Census statistics have a significant relationship to school expenditures.

There are two rather serious disadvantages to the use of these data. In the first place, as decennial census statistics, they become obsolete over a 10-year period. At the present time this material is approximately seven years old. Moreover, because of the fact that school district organization in the state of New York rarely, except in the larger cities, follows local government or census tract boundary lines, it is difficult to prepare such statistics for geographic areas coterminous with school districts. In its present analysis it was necessary to approximate the distribution of U. S. Census statistics where Census tracts overlapped school districts. This was accomplished by prorating in proportion to school enrollment. In general, the results are acceptable even though inadequate measurement is to be expected for a small proportion of school districts.

The U. S. Census measures considered in this analysis are listed below with brief comments.

Median school years completed, population 25 years old and over, 1960. Related to expenditure, but net contribution not great when used in combination with other demographic measures.

Percent housing units not owner-occupied. High relationship to underachievement (low test scores) of pupils in school. Not measured by size of district except for extremely large urban districts such as New York City. Virtually unrelated to expenditure.

Median family income, 1959. As with other economic variables, it is highly related to what districts spend and measures of accomplishment in schools. Has random relationship (zero correlation) with size of district. Considered not appropriate as need or cost factor, but rather element of ability-to-pay aspect of equalization plan.

Percent of civilian labor force unemployed, 1960. Highly related to school expenditures, schooling of adult population, median family income, and indicators of school needs such as underachievement and handicapped pupils. Little relationship to size of district.

Percent of housing units not in one-unit structure. Highly correlated with percent housing units not owner-occupied and highly related to underachievement measure, though not as high as the latter.

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[3] See for instance: James, H. Thomas; Kelly, James A.; and Garms, Walter I. *Determinants of Educational Expenditures in Large Cities of the United States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 2389. Stanford, Calif.: Stanford University, School of Education, 1966. 198 p.

Government Consulting Service. *Special Education and Fiscal Requirements of Urban School Districts in Pennsylvania, a Research Inquiry: The Impact of Social and Economic Conditions on Urban Education and State Fiscal Policy.* Philadelphia: Fels Institute of Local and State Government, University of Pennsylvania, December 1964.

Median age of population. Little relationship to direct measures of educational needs.

Percent of residents in same house in 1960 as in 1955. Used as indicator of population mobility, but found not to be a function of district size and not related to expenditure and hence cost elements.

Percent of structures built before 1950. Positive relationship to size of district only since larger city districts have high percentage of units built before 1950. Omitting the six largest districts, correlation with expenditure, is low.

Percent housing units having 1.01 or more persons to room. Slight positive correlation with underachievement, no relationship to size or expenditure. Measures about same thing as housing units not owner-occupied.

Population per square mile, 1960. More recent and more direct measure available as *pupils* per square mile.

Percent of families with incomes below $3,000. Did not add usable additional information to median family income measure.

School Measures

In addition to what was derived from the 1960 U. S. Census, the current study included a series of measures available from standard school reports and special reports available in the State Education Department. These measures have one advantage over the U. S. Census measures in that they are more current and up to date and they are most closely related to educational conditions reflecting an educational overburden and presumably excess costs. Following are the school measures which were analyzed.

Operating expenses per WADA. Used as dependent variable or guide for analysis in study. Varies significantly with social and economic measures.

Full value per WADA. Used as control variable in analysis. Although a factor in what districts *spend,* it does not determine variations in *cost* of comparable services.

ESEA, Title 1, allocation children as percent of WADA. Highly related to social and economic conditions not conducive to school learning. Considered more an economic or financial ability factor than a *cost* measure because of "poverty" loading. Also, undesirable to use as correction since it may duplicate federal programs.

Handicapped as percent of total enrollment. It is associated with measures of complicating social conditions and achievement levels of normal pupils in school. Only to a negligible degree is this correlated with the size of district. Unfortunately, it is not at present in New York a readily available and reliable statistic. Various categories of "handicapped" need separate treatment or weighting and clear distinction is needed between number in school locally and number of residential handicapped in school, whether at home district or elsewhere.

Ratio of high-school dropouts to graduates. A logical indicator of the success of a school system in serving its school population. Some relationship to size of district, but greater relationship to other demographic factors. Undoubtedly in part an indicator of educational overburden requiring excess costs, yet is partly owing to low-expenditure levels and inefficient or inadequate secondary-school programs.

Pupils per square mile. Not much relation to size of district or expenditure. The most dense district is not among the largest city districts. Also, not a good indicator of demographic conditions closely related to school situations.

Percent of school population in public school. Unrelated to size of district and adds little to other indicators of school program and expenditure variables.

Pupil-teacher ratio. Low correlation with school achievement and size among districts over 2,000 WADA. However, increasing staff may be one of several methods of overcoming excessive cost burdens where they exist.

Weighted average daily attendance (WADA). Found to have low or insignificant relation to measures more directly indicative of cost elements in districts over 2,000 WADA.

Underachievement. A reciprocal of an average of percentile scores from the state testing program, including a first-grade readiness test, and arithmetic and reading tests in the third, sixth, and ninth grades. It is a direct indicator of educational conditions needing remediation and for which additional expenditures would be necessary. Low achievement as measured by tests may indicate an inefficient educational program yielding low return per dollar of expenditure. Allowances for this measure could be rewarding inefficiency. For other reasons it may be undesirable to use it directly in allocation for state aid. In this analysis, it was used as a statistical guide or bench mark for combining other measures.

Free lunches as ratio to enrollment. Useful only in identification of New York City.

Holding power, ratio of twelfth to ninth grade three years previously. Ineffective since growing districts with dropouts had high ratios. Dropout to graduate ratio considered preferable.

Percent non-white school population. Studies show this factor absorbed by social-economic measures, indicating problem of adjustment is independent of race, color, or creed.

Expenditures, Cost, and Size—Large Districts

The present size correction is tenable only to the degree that elements of differentials in cost per pupil are related directly to the size of the district. For this reason, analyses were made in a sample of larger districts with a number of variables and with their relationship to expenditures and district size. As an account of these analyses will show, size alone is an invalid criterion or measure for determination of unusual and varying cost conditions of school districts. Furthermore, prevalent theoretical formulations concerning cost in relation to size of school district are not supported in data from New York State school districts.

An analogy on the cost and size of school relationship has been drawn from economic theory applied to business operations.[*] This produces a U-shaped unit-cost curve plotted against size—high for smallest districts at the low end and high for large districts on the high end. It is assumed that increased complexity in the functions of the very large systems may add to costs. The work in coordinating and communicating in an organization so large that there is a large volume of activities of administrative management could add to costs per pupil purely as a consequence of the complexity of the large system. It is inferred that when a school system reaches a certain size such that this increase in variable unit costs begins to more than offset the declining costs, the total unit cost increases.

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[*] Hansen, Nels W. "The Size-Cost Relationship in Public Schools." *Trends in Financing Public Education.* Proceedings of the Eighth National Conference on School Finance. Washington, D. C.: National Education Association, 1965. p. 125-33.

This U-shaped model is the nearest to a theoretical formulation which would support the size correction. The size correction in New York State is irregular. It does not follow such a graduated and smooth trend. Yet some such general theory as this is the only justification for the size correction.

Since we deal here with a *theoretical standardized unit cost* for a standardized program of service, it is difficult to test out such a theory in practice. Such a theoretical unit cost is impossible to specify. Amount spent per pupil is available, but expenditures and costs are two different things. For this reason, an analysis was made of the relationship of expenditures per weighted average daily attendance to a number of factors which can be useful in *adjusting expenditure so that it is more like a unit-cost criterion.*

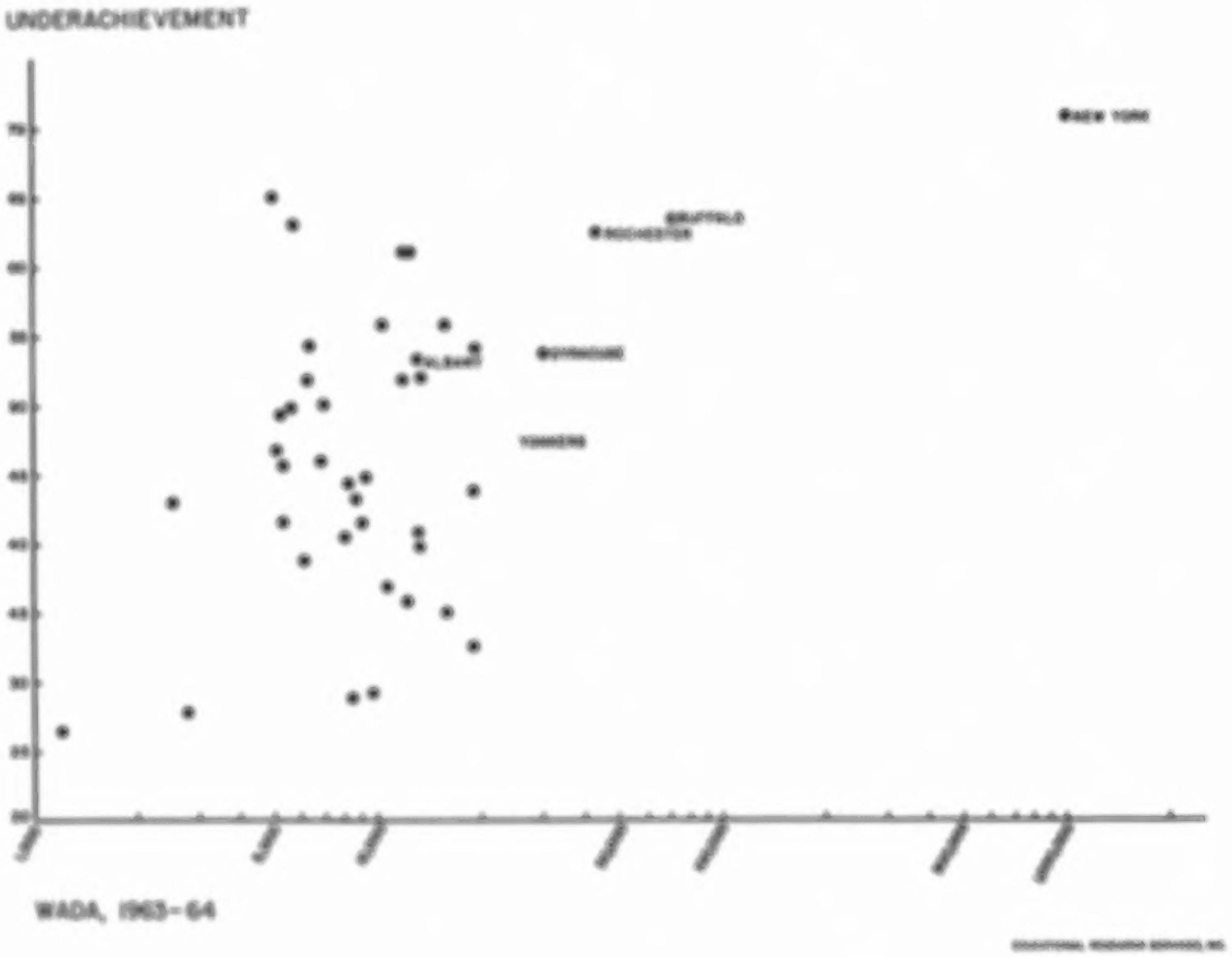
Some notion of the relative insignificance of size of district on expenditure and cost is gained through a multiple regression analysis. Such an analysis in large districts with operating expense per WADA as a dependent variable and log WADA and percent of unemployed as independent variables, shows that the *net relationship of an economic and social indicator, such as percentage of unemployed, has much more to do with the determination of expenditure for schools than size itself.* By the addition of the size factor to the correlation with expenditure, correlation is increased slightly. Similar analyses revealed that, other things being equal, *there is a tendency for the places with greatest underachievement to be those that are spending more money. This is some support for the conclusion that there is greater cost where there are conditions producing low accomplishments as measured by achievement tests.*

Analysis, such as the above, casts doubt on the validity of a correction based on size alone. When a number of factors which would be related to expenditure are ruled out by statistically holding them constant, the net contribution of size, as measured by enrollment amounts to little.

One method of doing this is to relate size to *residuals* of expenditure per pupil from regression equations which have taken effects of other variables, such as taxpaying capacity of the district and certain other characteristics, into account. These residuals represent the distribution of expenditure if school districts were much the same as to ability to pay and similar in social characteristics related to the kind of education needed. They might be expected to average out much as would a standard cost unit.

An exploratory analysis of this type was made with New York State school districts, and no support was found for a general theoretical unit-cost curve based on size. The results indicate that elements of unit cost, independent of factors of community that have a strong influence on what the total expenditures are in communities, *do not follow a clear-cut trend.* A slight negative relationship of residual costs and size was found. There is a tendency for large districts to spend less relative to local resources. This may be attributable to the municipal overburden in the large places or it might be due to tax limitations and other restrictions for supporting education in the very large places. *Nevertheless, the trend is a continued decline with size.*

A possible exception is New York City. New York City, much greater as it is than other districts in the state, and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NEW YORK
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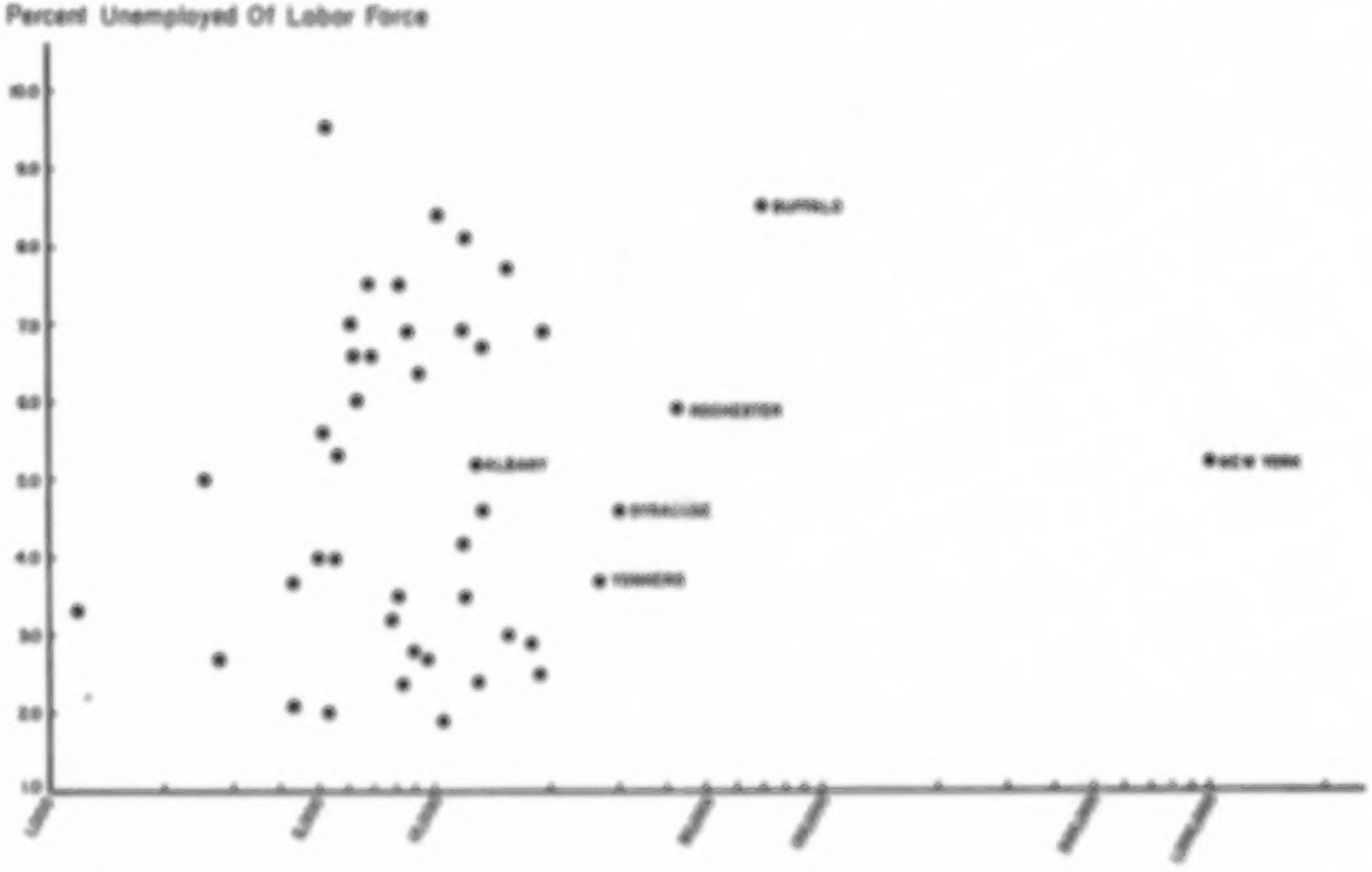
WADA, 1963–64


Percent Unemployed Of Labor Force
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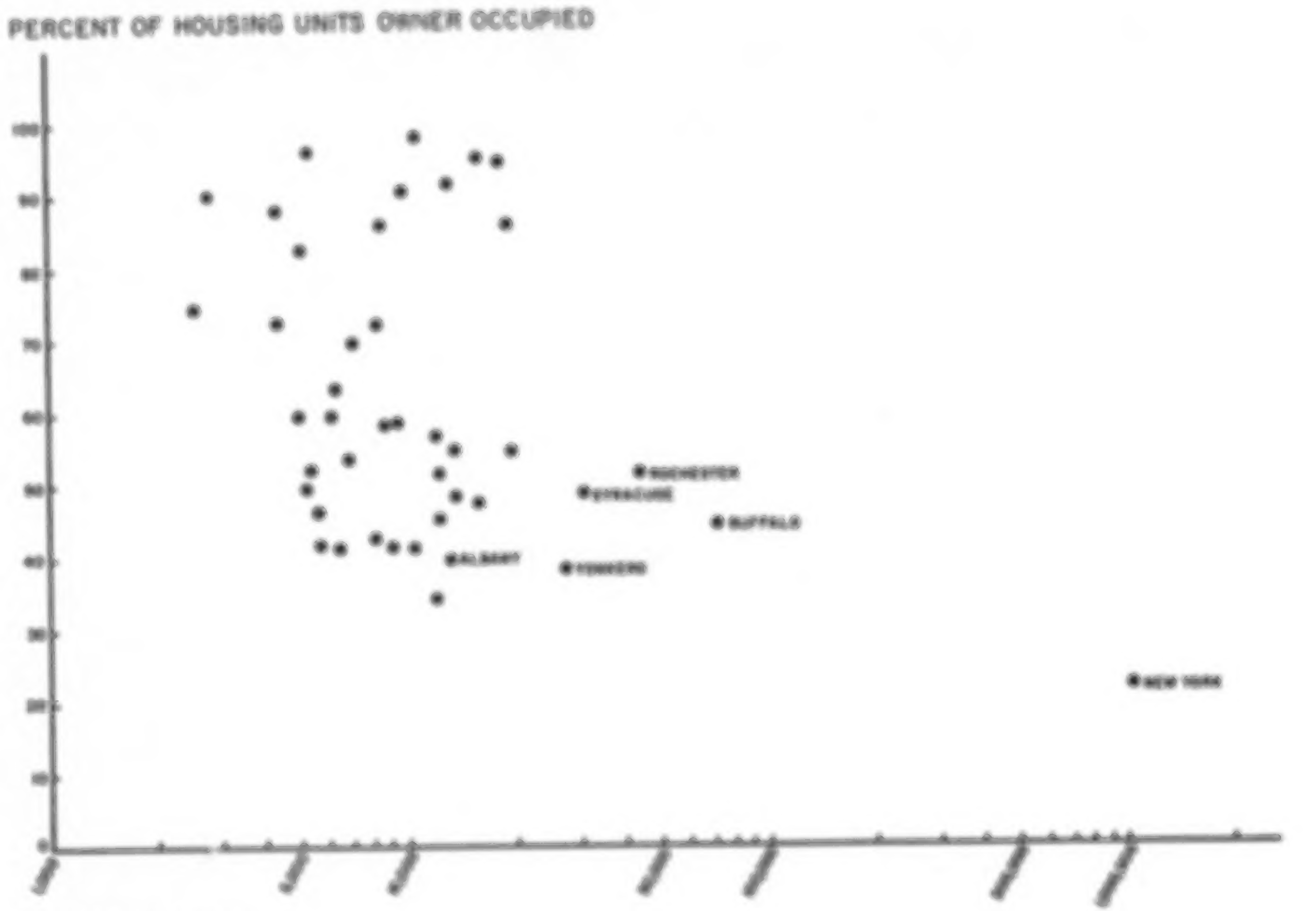
ALBANY
SYRACUSE
YONKERS
NEW YORK

WADA, 1963–64


PERCENT OF HOUSING UNITS OWNER OCCUPIED
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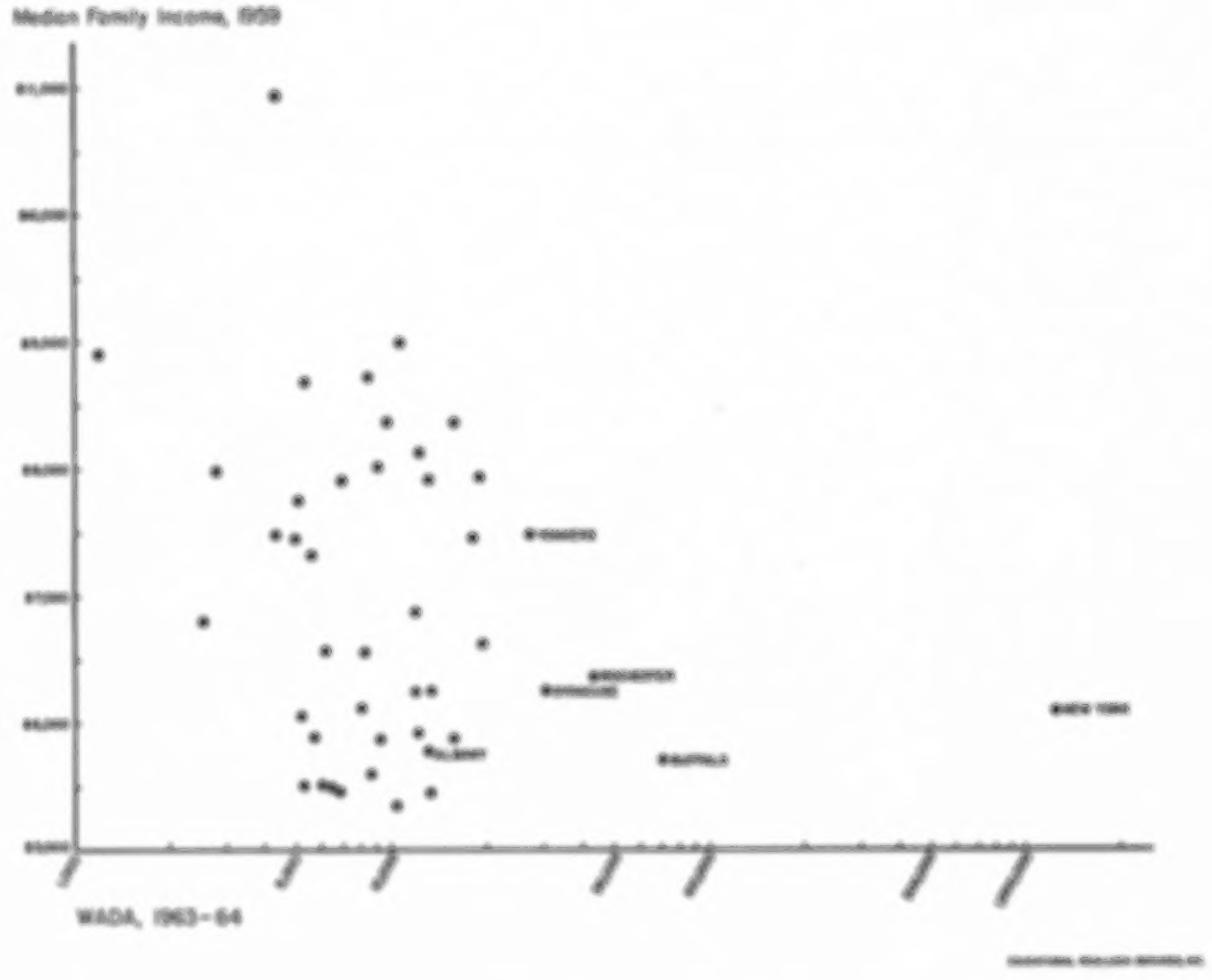
WADA, 1963-64


Median Family Income, 1959
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$10,000
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YONKERS
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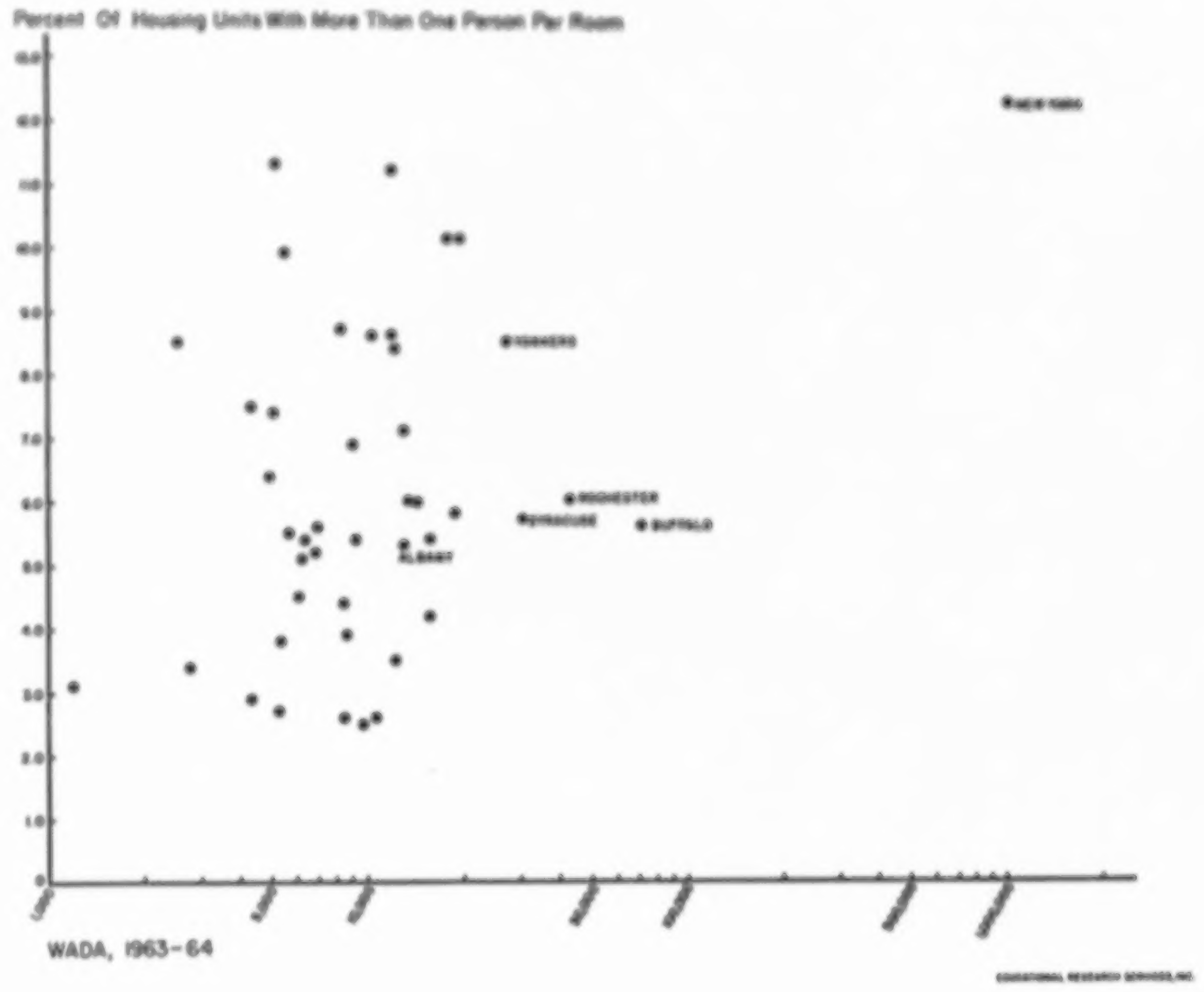
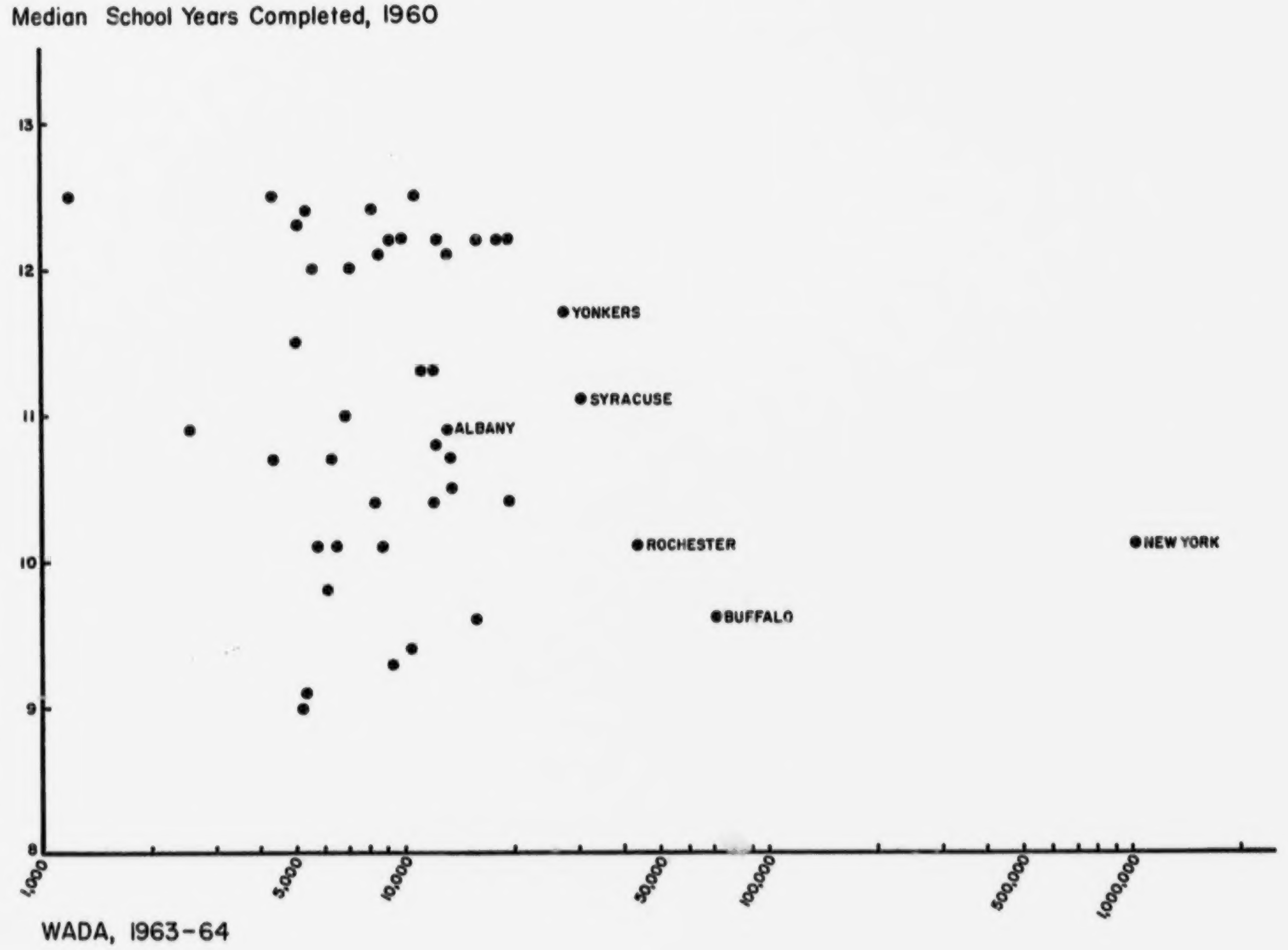
NEW YORK
WADA, 1963–64

Percent Of Housing Units With More Than One Person Per Room
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
YONKERS
ROCHESTER
SYRACUSE
BUFFALO
ALBANY
NEW YORK
WADA, 1963-64
EDUCATIONAL RESEARCH SERVICES, INC.



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as unique as it is compared with other parts of the state, certainly might be expected to have unique characteristics which would justify some form of special correction. Whether or not this is justifiable for other big school districts, on the same basis, is to be questioned. Without the big six, the distribution of the remaining districts is random, indicating no relationship whatsoever between residuals representing unit costs and the size of district. Scatter diagrams which follow show the relationship of district size and several measures known to be related to cost differentials. They are based on the sample of 42 urban districts. In rare instances is a relationship with size indicated and then only insofar as identifying the very largest districts.

Small Districts and Sparsity

As it now stands, the "size correction" in New York bears no relationship to cost differentials arising because of size of school or sparsity of pupil population. Moreover, such corrections for very small districts have encouraged the continuation of inefficient school district organization.

Recent studies have shown that the size correction for small districts is unrelated to genuine cost differentials. The original method of determining a small district correction or cost differential was comparing staffing required in small districts with that in larger districts. There is evidence that such differentials vary from year to year and that only a small portion of the amount allocated to small districts is actually related to cost.[7]

As of the fall of 1965, the average staffing ratio among all school districts in the state was 54.2 teachers per 1,000 pupils. In districts with 1,000- 1,499 enrollment the average was 53, as it was also for districts with 1,500-1,999 enrollment. Districts with enrollments of 500 to 999 averaged 55. Only among the very small districts, the 161 with fewer than 500 pupils, is there a significant increase in average staffing ratio. Moreover, in small districts the range in staffing ratios is very great, so that an average cannot be an accurate basis for determining cost differentials.

It is thus apparent that the size correction at the low end of the size scale, beginning at 10 percent, is not a cost differential related to staffing requirements or staffing practices in school districts. It must be viewed under the current condition of school district structure as a purely arbitrary correction. A tabulation of such information as the underachievement measure used in this analysis shows also that the size correction is unrelated to such evidences of need for cost differentials.

The solution for small districts, possibly those smaller than 2,000 or 1,500, and assuredly those under 1,000 appears not to be a size correction, but rather such alternatives as:

1. Legislation which will step up progress in school district reorganization and eliminate unnecessarily small districts.

2. A type of special legislation authorizing grants only to justifiably small districts on the basis of approved performance budgets meeting specified criteria.

3. The development of a correction or other change in state aid allocation which will take into account unusual social and economic conditions which in this study have been found to exist

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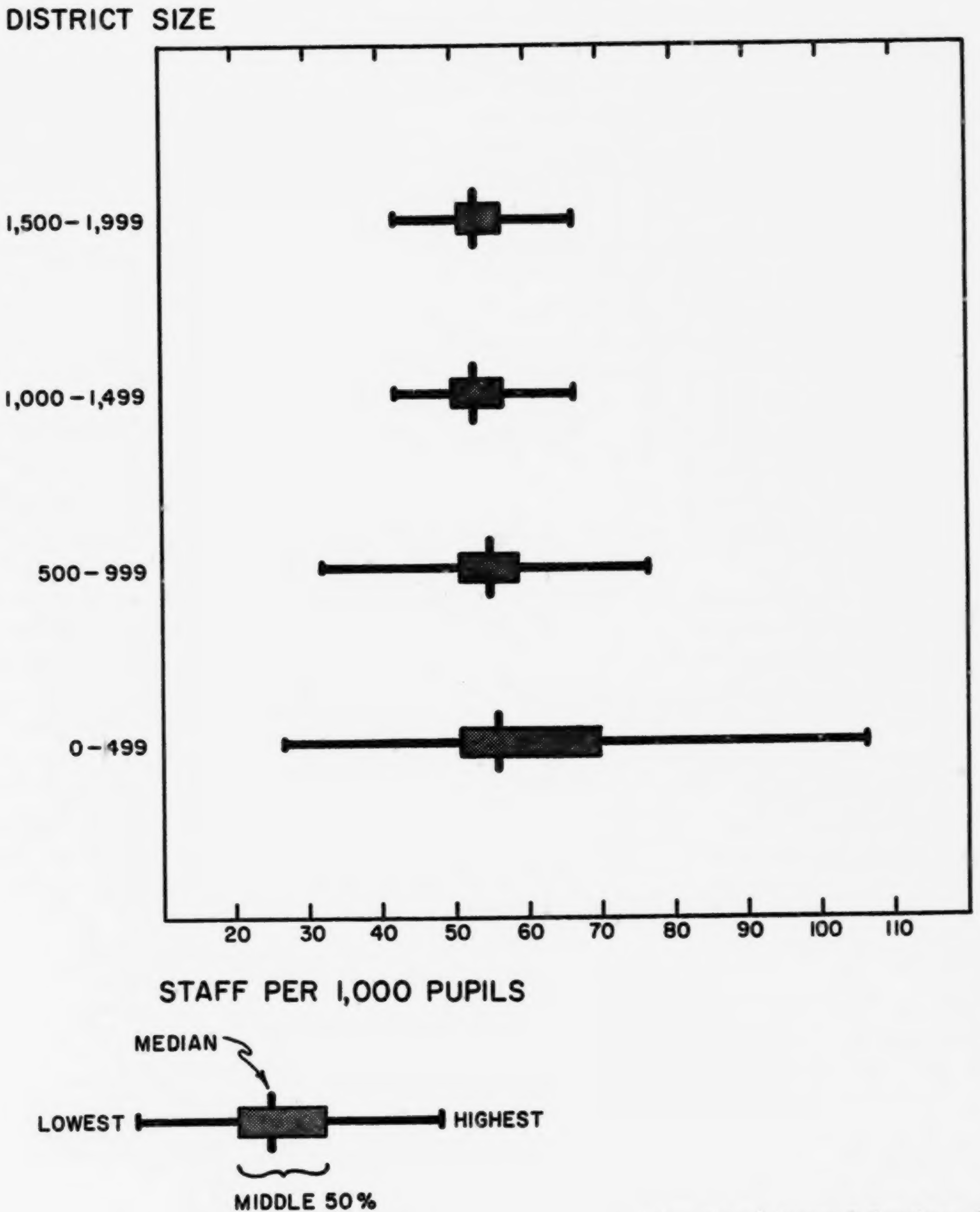
[7] Hedlund, Paul A. *A State Aid Correction for the Added Costs of Operating Small Schools.* Albany: State Education Department, October 1965. 23 p. (Manuscript)

Hogan, Lloyd L. *Variations in Public School Expenditures Associated with Changes in Elementary and Secondary Enrollments.* Albany: State Education Department, July 1966. 31 p.

PROFESSIONAL STAFFING RATIOS IN SMALL DISTRICTS



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in all types of school districts, urban, rural, suburban, large, and small.

A Hypothetical Correction by Formula

The underachievement measure, as will be demonstrated, is highly related to aspects of community which might justify corrections in state aid allocations for operating expenses aid. Since it is, itself, an indicator of educational overburden in a school system, so to speak, it might be used directly as a basis for an adjustment or correction in state aid allocation. On the other hand, since there are variables which are highly related to it, it might be used as a criterion, rather than a measure itself, for purposes of developing other measures.

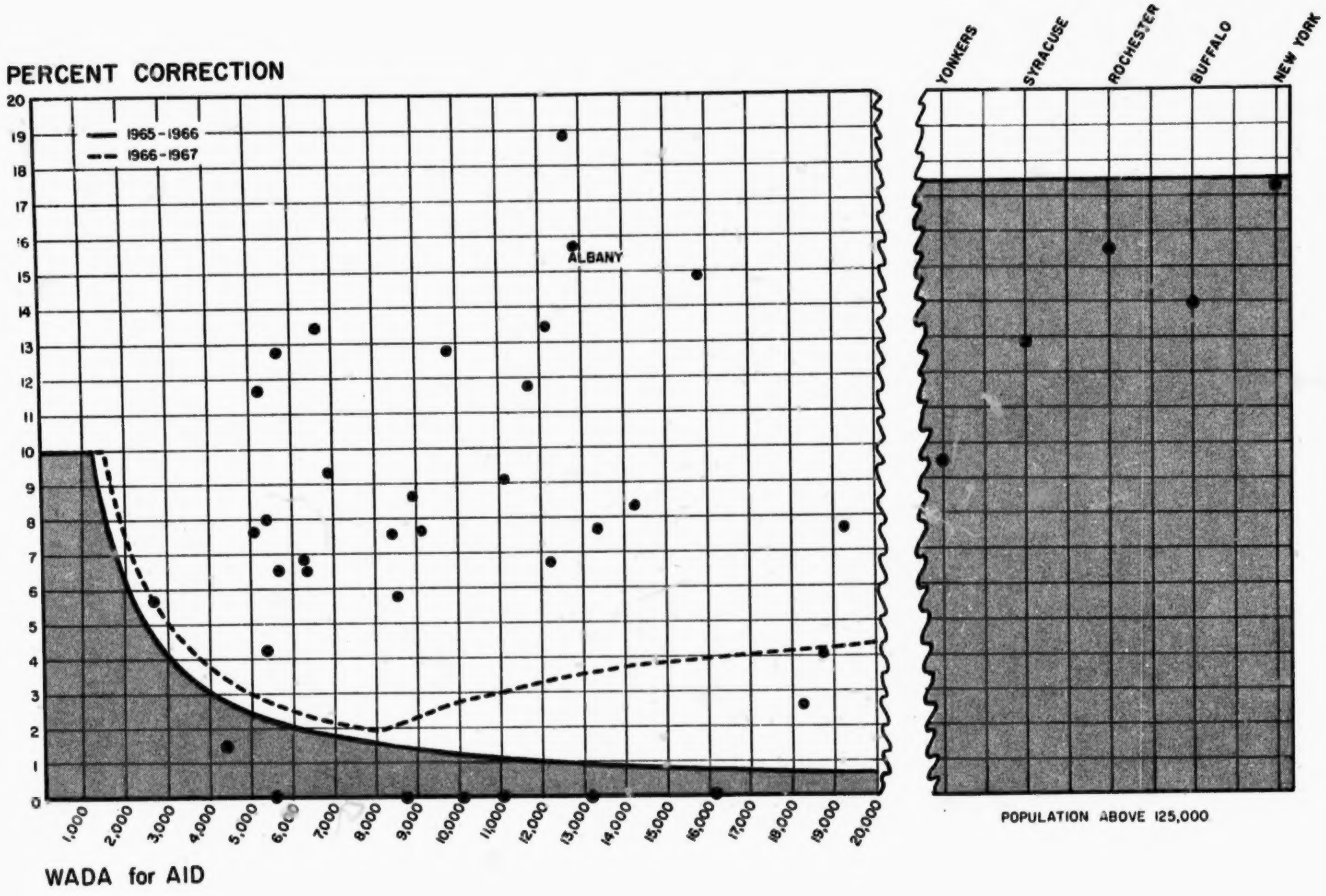
There are objections to the use of underachievement directly. If based upon local tests, there would be an inducement for local school districts to teach for tests, or otherwise there would be opportunities for manipulating local data if it were to be a basis for the allocation of state funds. This might be considered an undesirable way to link results of testing to state school financing. Also, achievement test results alone provide only a partial picture of the educational situation in a school district. School achievement in reading and arithmetic, as covered by these tests, touches upon only these basic skills. As important as they are, there is considerably more to the picture of an educational program. Nevertheless, school systems in which there is marked underachievement are evidently in a situation requiring an additional financial effort. For this reason the approach of using the test data as a criterion for the development of other measures which are closely related to it appears to deserve special merit.

In presenting the formulas in the following, it is emphasized that the objective is a technical analysis of relationships and measures, not the development of a specific adjustment formula. It is theoretical in a sense, therefore, since our attention here is on finding out as much as possible about the phenomena involved.

As a demonstration of the implications of this approach, the slope of a multiple regression line, the net regression coefficient, was computed for the underachievement variable as a predictor of expenditure. The result indicates that there is an increase of $2.30 in expenditure with each unit increase in the underachievement variable.

TABLE 2.—INTERCORRELATION MATRIX FOR REGRESSION OF UNDERACHIEVEMENT MEASURE ON FOUR VARIABLES, 42 LARGE SCHOOL DISTRICTS

Variable	X_{16}	X_5	X_7	X_8	X_9
1	2	3	4	5	6
16. Underachievement	1.0000	.6816	.5207	.6878	.5765
5. Percent housing not owner-occupied		1.0000	.5349	.7297	.4003
7. Percent unemployed			1.0000	.5301	.3576
8. Percent handicapped enrollment of total				1.0000	.3365
9. Percent ratio, dropouts to graduates					1.0000



SIZE CORRECTION FORMULA

PERCENT CORRECTION BASED UPON FOUR UNDERACHIEVEMENT INDICES

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TABLE 3.—REGRESSION OF UNDERACHIEVEMENT MEASURE ON FOUR VARIABLES

Variable	Beta coefficient	Regression coefficient	Percent of variance	Coefficient for percent correction*
1	2	3	4	5
X_5. Percent not OOH	.2491	.131	17.0	.083
X_7. Percent UNEMP	.0839	.431	4.4	.274
X_8. Percent HANDP	.3509	3.280	24.1	2.090
X_9. DO/GRAD	.3287	.364	19.0	.232
Total	...	27.5**	64.5	−4.8**

$n = 44$.
Multiple $r = .8027$.
*Adjusted so that New York City = 17.5 percent and 35 = zero percent.
**Constant (intercept).

A multiple regression equation was derived by using underachievement as a dependent variable and the four variables shown in Table 2. There is relatively low intercorrelation between such things as the unemployed measure and the dropout measure and the unemployed measure and the handicapped measure, but all four measures have reasonably high correlations with underachievement. A high interrelationship between the handicapped figure and the percent of housing units not owner-occupied was observed. It is thus to be anticipated that these two somewhat highly related measures are going to contribute somewhat the same thing to the multiple correlation.

Table 3 summarizes results of the regression analysis. The standard regression coefficients show that the two measures, (a) the handicapped and (b) the dropouts to graduates ratio, contribute more to the explanation of the dependent variable than the other two. The third most important variable is the measure of percent of housing units not owner-occupied.

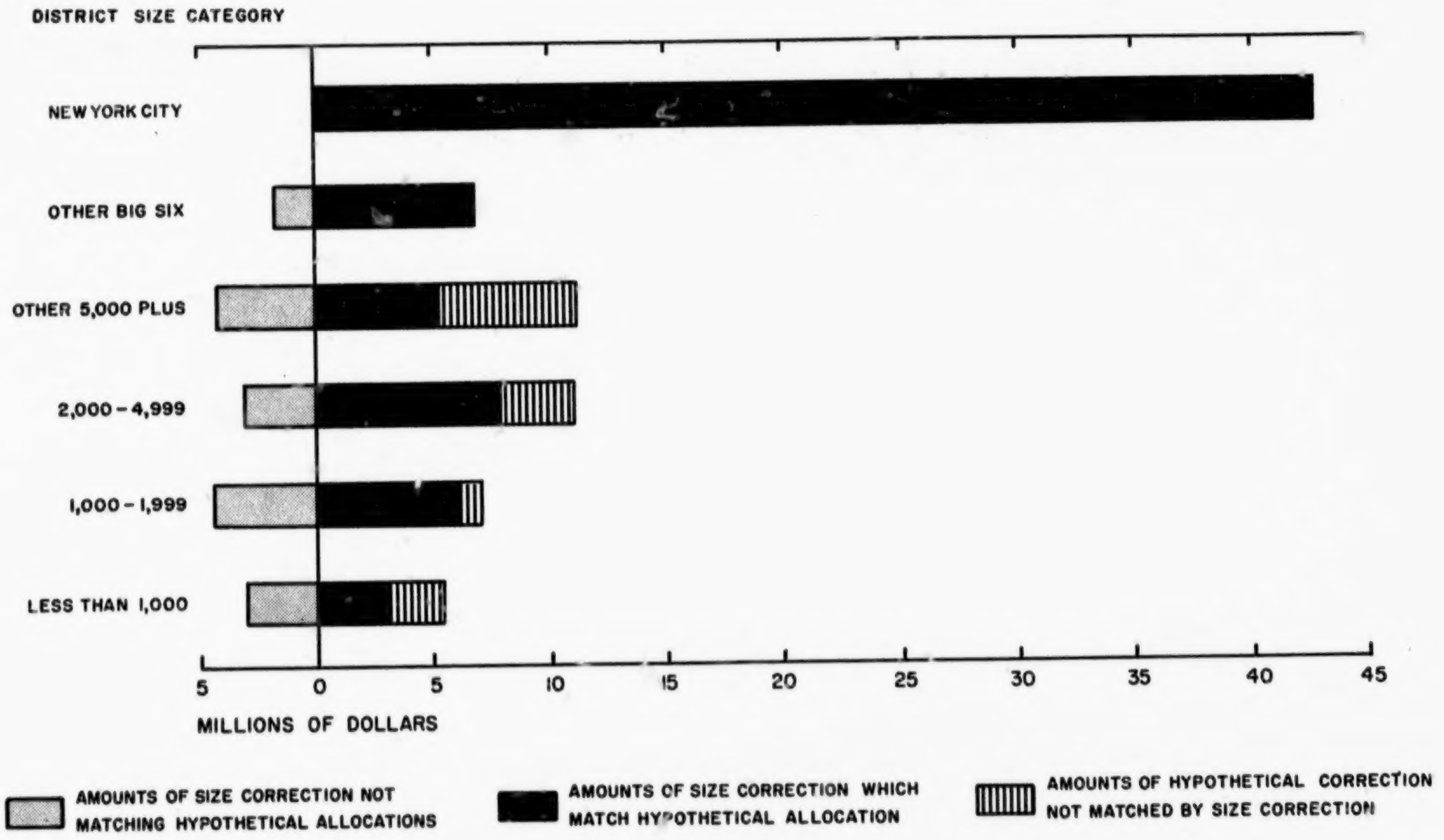
The actual coefficients in the regression equation are shown in the second column of figures. The third column shows the percent of variance in underachievement explained in the net by the respective four measures. The last column is the conversion of the regression equation to something in the order of a percentage correction. To keep it comparable to other indexes in this analysis, it is hitched to the 17.5 percent for New York City and what appears to be an appropriate zero point of 35 in the underachievement measure.

Considerable encouragement may be derived from this analysis:

1. Indexes reflecting underachievement may be used instead of that measure itself, should this be desired. The multiple correlation is high, .8027.
2. Indexes reflecting underachievement are derived directly from measureable conditions in school districts.
3. These indexes are of a type which have a logical relationship to indigenous situations in school districts requiring more cost.
4. There is reasonable balance in the combination since both sociological and educational factors are included.

This application would have the advantage of being derived exclusively

Relation Of Size Correction & Hypothetical New Correction, 1966-67



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from information on indicators of needs that are directly related to costs. There is little question but that where there is a high percentage of dropouts, many costly services are required such as special programs and higher staffing ratios for specialized personnel and classes.

Comparison with Size Correction

The foregoing hypothetical correction by formula was applied to all school districts in the state of New York as a final step in examining the nature and magnitude of such an approach. The application was complete for districts of 5,000 WADA and over, and was made by sampling in districts of less than 5,000 WADA.

The objective was primarily that of comparing such a hypothetical correction with the existing size correction. This is in line with the authorization for the study which indicated it was "to examine the suitability of present state aid in relation to educational problems resulting from unusual social and economic conditions which exist in New York City, other cities, large school districts and other districts in the State." Although the hypothetical correction was derived from a formula which would not be considered practically applicable and although it is made up of data not sufficiently objective and reliable for individual districts, it is considered valid enough to indicate costs of such an aid adjustment and the nature of its distribution among school districts of various sizes in the state.

Following are specific observations to be made on the basis of information analyzed to date. Most of this is drawn from the accompanying table.

1. The size correction this year costs $88,015,000.

2. Over half of this, $51,357,000, or 58 percent, is for New York City and the other big six districts.

3. Approximately $71,700,000 of the size correction total goes to districts in a way which would cover (overlap)

TABLE 4.—OVERLAPPING AND UNRELATED AMOUNTS OF SIZE CORRECTION AND HYPOTHETICAL CORRECTION, AS OF 1966-67, BY DISTRICT SIZE CATEGORY

(In thousands)

District size category	Size correction		Amount of overlap	Hypothetical correction		Total without duplication (3+4+5)
	Total	Unrelated (2-4)		Unrelated (6-4)	Total	
1	2	3	4	5	6	7
New York City	$42,765	$ 0	$42,765	$ 0	$42,765	$42,765
Five of big six	8,592	1,684	6,908	3	6,911	8,595
5,000 and over (other)	9,232	4,139	5,093	6,067	11,160	15,299
2,000-4,999	10,838	3,037	7,801	3,195	10,996	14,033
1,000-1,999	10,584	4,396	6,188	774	6,962	11,358
Less than 1,000	6,004	3,059	2,945	327	3,272	6,331
Total	$88,015	$16,315	$71,700	$10,366	$82,066	$98,381

allocations on the new type of correction. Of this, nearly $50 million, 69 percent, is in the big six city districts.

4. The closest matching of the size correction and a correction which would be related to educational problems resulting from unusual social and economic conditions is in the big six cities. With New York City assumed to be 100 percent, 80 percent of the size correction allocations would cover the amounts under the hypothetical correction. The other 20 percent of the size correction is unrelated to the new type.

5. In the remaining districts, some now receiving funds under the size correction would receive little or none under the hypothetical correction. The percent of size correction funds corresponding to the hypothetical allocation is as low as 55 percent in districts with 5,000 WADA or more (other than big six districts) and as low as 49 percent in districts with 1,000 or less WADA.

6. Taking the overlap between the size correction and the hypothetical allocation into account, an additional $10,366,000 would be needed to provide the estimated $82,066,000 needed for the "social and economic conditions" type of allocation.

7. If such a hypothetical allocation were to be made under a "save harmless" basis, the total amount required for the existing size correction and the new type combined would be $98,381,000.

8. The major amount of new money needed under such a plan would be for districts in the size categories of 2,000 and over, other than the big six.

9. A large part of the need, as measured by the hypothetical correction, in districts under 2,000 is more than covered by the size correction. This is because of the "sparsity" element of the size correction aimed at staffing ratios as related to cost in smaller districts.

10. To the degree that an adjustment in state aid of a type similar to the hypothetical correction is desirable, the greatest relative need appears to be in the large districts other than the big six.

Other Comparisons

Relation to federal programs—There is a relatively high degree of correspondence between the new type of correction and federal fund allocations. In districts of 5,000 WADA and over, the correlation between the percent hypothetical correction and total federal aid allocation per WADA is .66; between the percent hypothetical correction and ESEA, Title 1, it is .89. In districts with 5,000 or more WADA, other than the big six, 78 percent of the hypothetical allocations are now matched by Title 1 allocations. The correspondence between the two allocations is least in smaller districts.

Correspondence between the "social and economic conditions" type of grant with federal Title 1 allocations needs to be viewed in terms of degree of correspondence in objectives and in programs served. In concept, the hypothetical correction would contain an element of the "poverty" measures used for Title 1, for example. However, an adequate definition and measurement of the hypothetical correction would presumably be broader in coverage, reflecting social conditions bearing impact on costs not limited to the economically deprived. Preliminary analysis by staff of the State Education Department suggests that there might well be a small proportion of the federal program which would overlap in purpose and function the regular programs of the state education system.

Advantages of Fiscal Independence for School Districts

Eugene P. McLoone

EVERYONE SHOULD favor fiscal independence for school districts just as everyone should be for peace, motherhood, and country. Still there are the hawks and the doves, and fiscal independence has its attackers and supporters. Almost all educators and the research done by them support the superiority of fiscal independence. On the other hand, most persons from other fields of study and their research, notably in economics and political science, support the superiority of fiscal dependence.

Creating the dichotomy of fiscal independence and dependence implies the necessity to take a position for one or the other. Making these two terms, *dependence* and *independence,* the end points of a continuum with many shades of gray between the white and the black (or the black and the white), makes choice a little more difficult. Such a continuum also presents many problems for the researcher. It is not as easy to prove the relative advantages or disadvantages of various points on the continuum without attempting to prove the superiority of either end point.

For example, the single dimension used to determine fiscal independence or dependence has usually been access by a school board to its own tax sources. Since schools have been financed more than 99 and 44/100 percent from the property tax at the local level, this access has meant, in actuality, access to power to levy a property tax. If school districts in the 1957, 1962, and 1967 Census of Governments [1] are classified by this dimension, on a gross basis for the nation these data indicate that fiscally independent school districts spend $22 more than their opposities for 1957, and $60 more in 1962. The results are clear, but one could add that fiscally independent school districts received more than $44 additional state aid than fiscally dependent districts in both years. The comparisons could be continued until one accounted for the variations in enrollment, geographic location, history of support for edu-

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[1] U. S. Department of Commerce, Bureau of the Census. *Finances of School Districts.* Vol. III, No. 1, Governmental Finances, 1957 Census of Governments. Washington, D. C.: Government Printing Office, 1958. 367 p.

U. S. Department of Commerce, Bureau of the Census. *Finances of School Districts.* Vol. IV, No. 1, Governmental Finances, 1962 Census of Governments. Washington, D. C.: Government Printing Office, 1963. 58 p.

cation in the state and many other factors. All of these additional variables could and should be analyzed to determine the residual effect of this single variable of the board's access to property taxes. Nonetheless, this greater effort would hardly settle the controversy of fiscal independence vs. dependence. The assumption of a dichotomy of fiscal dependence-independence forces an analysis restricted to a rather narrow aspect of the legal structure of school districts.

Viewing fiscal dependence-independence as a continuum permits better analyses, such as those suggested by James,[2] and permits more attention to other aspects of the legal structure and to the economic, social, and political aspects of not only the local school board but also other educational decision makers. These other aspects, the manner by which school board members are selected: whether by election or selection, whether on a partisan or nonpartisan basis if elected, whether representative of the community or interest groups, whether spokesmen for the whole community or a geographic or an ideological part, and so forth are important considerations as to the independence of the school board from community factors unrelated to education.

Direct selection of the school board by the voters, direct access to taxes by the local board, and final determination of spending by the local board are the main considerations of fiscal independence. Fiscal independence, however, is only part of a total conceptual framework of local control of schools by lay boards and citizens of the community. Other imperatives of this totality have been these: (a) Local citizen interest should be maintained in schools. (b) School districts should be of adequate size to operate effectively and efficiently. (c) State grants should not contain inordinate controls. (d) Leeway should be left in local taxing power for programs beyond those mandated by the state. (e) Local taxing power should make a contribution to the support of schools.

This traditional conceptual framework has remained although the social, economic, and political forces within which the schools operate has not remained static. Technology has changed industry, and education in particular. An explosion of knowledge with many implications for curriculum has occurred. Yet no attempt has been made to revise the conceptual framework within which fiscal independence is an important part.

This paper examines fiscal independence past, present, and future. No attempt is made to be all inclusive in the factors presented; those selected are thought to be of major consequence. The exercise is one of restructuring the concept of fiscal independence so that it is not a hallowed remnant of the past with no future, but rather a concept that is viable for schools under changing conditions.

Fiscal Independence—Past

Conceiving of fiscal independence-dependence as a continuum would require the study of various combinations to determine what point on the continuum is best for education. The related question asked by political scientists and economists is what is best for all government services, including education, in the totality. The views of educators and others can best be seen in an analogous situation in which charitable organizations join or do not join Community Chest or United Givers. The most notable group which does not join is the Red Cross. Red Cross leaders seem to think that they do better going it alone. Educators, committed to fiscal independence, also think they do better going it alone rather than uniting with other government services.

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[2] James, H. Thomas. *School Revenue Systems in Five States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 803. Stanford, Calif.: Stanford University, School of Education, 1961. 143 p.

Thus, for the Red Cross and for education, fiscal independence is best for them, considered from their viewpoint. However, if the Red Cross joined other charities and while the Red Cross obtained less money, the combined drive obtained more than the sum of resources obtained by the Community Chest and Red Cross acting separately, the over-all community would need to consider the net losses and net gains, and the separate agencies would need to examine their loss against a community gain.

Whether education should be fiscally dependent or independent would require a similar analysis. On the assumption that education received less resources, would the community gain? Would the gains for other governmental services outweigh the loss to education? In this framework, the opposing views of educators and others are clear. Educators think that education does best by itself. Others think that there is an over-all community gain if education is joined with other governmental services. Unfortunately, all that exists are views. The only empirical study of a related area, earmarked taxes, yields inconclusive results.[3] Education is supported better with earmarked state taxes in some states than it is in other states with unrestricted revenue. But other earmarked tax states support education less well than states with unrestricted revenue. The answer seems to depend on historical accident and historical patterns of state financing. It may be that continued citizen concern is more important than actual legal structure. After all, eternal vigilance is the price of freedom in the choice of either going it alone or joining others.

The key questions are: What is the amount of funds received? For what purposes are funds received? When an organization acts alone, it is assumed that it receives more funds than otherwise, and that funds are given for the expressed purposes of the organization. The organization is not controlled by others and their rules in spending the funds. Independence could be extended to segments of the educational program. Some segments, such as vocational education and special education, have sought to be free of general education. The questions raised above about education and other public services could be asked in turn of these segments of the educational program and general education.

Separatism for vocational education and special education has meant that more expensive programs than general education have obtained support which they most probably would not receive within the total educational context. These grant programs were complete educational programs with all aspects joined as an integrated package. The courses and curricula, the training of teachers, the equipment and facilities, and the defined school population were all established in a total packaged educational system, not unlike the products of educational industry today. Each program's objectives were established for a specific subpopulation. Such programs limit fiscal independence and the decisions of the local school board. The decisions are not limited to either acceptance or refusal. There are many peripheral decisions on these special programs and how they relate to the total educational program of the school district. Unrestricted local funds significant in the totality of what is spent are essential for widest discretion in local spending, or almost all decisions pass to the developers of special programs.

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[3] Tax Foundation. *Earmarked State Taxes.* Research Publication No. 2. New York: the Foundation, 1965. 80 p.

Looking at vocational and special education, one can observe that all educators did not adhere to the conceptual framework in which fiscal independence was so important. Local schools welcomed state and federal funds with restrictions. Not all educators worked for the same conditions to receive funds. Some groups sought funds for a part of the educational program for which most of the decisions were made beyond the local school district. Some groups sought to retain small districts with no concern for efficiency or effectiveness of school operation. To explore more closely the restraints on fiscal independence, we pass from the historical conceptual framework for fiscal independence to the present reality.

Fiscal Independence—Present

The key to fiscal independence of local school boards seems to be the amount and percentage of total spending at the discretion of local officials.[4] This requires that local officials have unrestricted funds. Direct access to tax funds is only one way to obtain unrestricted funds. Others are (a) general aid, with no purpose specified other than education, from a higher level of government; (b) an unrestricted overhead percentage in special grants; and (c) the recently developed incentive grants of the Wisconsin and Rhode Island plans. These four conditions fall on the independence end of an independence-dependence continuum, while matching grants, percentage of cost grants, and reimbursable grant provisions lie at the opposite end. The salary schedule grants of Morphet and Johns, vocational education, and special education lie toward the dependence end of the continuum also, but their position is not at all clear.

Incentive grants involve a constant proportion of funds from the state irrespective of local expenditure levels. The local school board determines the local expenditure level. Every school district making the same local tax effort has the same expenditure level guaranteed from state and local funds.

The matching grants, percentage of cost grants, and reimbursable grant provisions require an initial expenditure of money by local schools to qualify. Thereby, these grant provisions usually are of more importance to the wealthier school districts which have greater unrestricted local funds or greater local tax leeway. The Morphet-Johns salary plan also requires an initial extra effort by school districts which have teachers with less experience or education than the average of the state. Past spending patterns of the school districts determine which local districts must make an extra effort. The Morphet-Johns plan does not require the districts to make the extra effort, but encourages it, as the state is committed to share in the added expenditures after the initial effort. The state shares the added salary expenditures until a predetermined upper limit is reached.

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[4] Firman, William D. "Fiscal Independence of School Systems." *Trends in Financing Public Education.* Proceedings of the Eighth National Conference on School Finance. Washington, D. C.: National Education Association, 1965. See p. 122 for practical tests of fiscal independence, a viable present conceptual framework for fiscal independence, and usual statistical tests of data for superiority of fiscal independence.

Special grants, such as those for vocational education and special education, have the features of matching grants, percentage of cost, and reimbursable grant provisions. The passage of time in the case of vocational and special education has often alleviated the problem of the initial year. Expansions of these programs create the same problems as matching grants and so forth. As part of the total education program, vocational and special education grants can serve fiscal independence if they are, in some manner, made contingent on the total educational programs of the districts. Local school boards are thus assisted in using discretion in supporting services for these programs and in relating these programs to the total educational program.

The often discussed restrictions on local discretionary spending of grants and access to local tax funds, thereby affecting local control and responsibility, and fiscal independence seem less important than the method of operation of school boards in spending funds. Furno shows that present spending levels of school districts are closely related to their past history.[5] Year after year local school boards make decisions with respect to only small portions of the total budget. James, Kelly, and Garms found that budget decisions in great cities are most often made under the constraint of known revenues.[6] Previously, James found that increases and decreases in big city and other school district budgets are made by applying the same percentage to all categories of the budget and the total budget.[7] If these studies describe the situation of budget decisions, fiscal independence is important only if a long-term view of school expenditures is taken.

Adding new programs based upon consideration of present or initial costs without attention to recurring and future costs means that local boards have power only in one of a series of years. Changes in spending by percentage increases or decreases under the constraint of known revenues means decisions are made only for immediate concerns, and then only when forces outside the school board indicate that additional revenue is available. Many of these aspects of budgeting which are relatively fixed from year to year are alterable over a longer period of time. Relating yearly decisions to long-range goals will increase discretionary spending. The long-range view will permit development of policies and spending programs for emerging situations, and not leave the schools in the position of being passive reactors to the changing scene. Fiscal independence makes most sense in a conceptual framework which includes long-term planning for five or more years in the future.

Planning for changing school population—Growth, decline, or stability in school population creates either opportunities or problems for local school officials. As an illustration of the advantages of long-term planning, let us look at the decision on whom to hire for a teaching position. In order to make the situation somewhat realistic, let us assume that a person is to be employed to teach mathematics, and that the labor market is tight, as it has been for the past decade. The decision to be made will consider the advantages or disadvantages of hiring a less-than-qualified mathematics teacher but a teacher who otherwise meets certification and tenure requirements.

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[5] Furno, Orlando F. *History of Local School Expenditures.* Doctoral dissertation. New York: Teachers College, Columbia University, 1956.

[6] James, H. Thomas; Kelly, James A.; and Garms, Walter I. *Determinants of Educational Expenditures in Large Cities of the United States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 2389. Stanford, Calif.: Stanford University, School of Education, 1966. 198 p.

[7] James, H. Thomas. "Modernizing State and Local Financing of Education." *A Financial Program for Today's Schools.* Proceedings of the Seventh National Conference on School Finance. Washington, D. C.: National Education Association, April 1964. p. 50-59.

If the school population increases, the teacher can be transferred to her area of competence when a qualified mathematics teacher is employed. If the school population is stable, the teacher can be transferred to her area of competence only if other teachers in this area leave. If the school population declines, there is no easy solution and the less-than-qualified mathematics teacher needs to be used for a long time.

In the case of a declining school population, alternatives exist through in-service training and shifting of school personnel. In contrast, if an unqualified employee is hired, the employee can be released with a decline in school population. In the case of a stable or growing school population, a qualified person can be employed when found either in general recruitment or in the upgrading of existing employees. Thus, the school board can cover more eventualities by hiring a person who does not meet tenure and certification requirements at the time of employment.

Decisions, such as those above, are made within a legal, social, economic, and political framework. The degree to which the local board maintains discretion on policies depends mainly on its astuteness within a series of other factors such as the superintendent, past history of district interpersonal relations of board and staff, and changes in personnel of board at elections. Therefore, school-board decisions, and their whys and wherefores, may be more fruitful for examination of fiscal independence than the strict legal structure. Nevertheless, state legal limits on the breadth of decisions of the local boards must be considered. If the state aid law provides no funds for an uncertified teacher, the alternative above exists only for the wealthy school district which has access to local funds. On the other hand, strict tenure laws may encourage local decisions such as those described.

Known revenue constraint—The known revenue constraint on budget decisions results in the need for local school district leaders to be aware of the demands and resources of local governmental units fulfilling functions other than education. In the cases studied by James,[8] local officials were not restricted by access to tax sources but by psychological and political limitations of tax rates beyond the level to which citizens were accustomed. The well-known phenomenon that school district taxes on property are only a portion of the property tax burden in metropolitan areas affects local school district power. In rural areas, the only important governmental functions are highways and schools. In urban areas, these functions may account for as little as one-fourth of total government spending. In central cities, municipal functions can be especially important. Consideration of allowances for municipal overburden in state educational grants is one recognition of this problem. To the degree that local taxing power is affected by the use of the same tax sources for other governmental functions, the same legal definition of fiscal independence may be quite different in practice in the various areas of a state.

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[8] James, H. Thomas; Kelly, James A.; and Garms, Walter I., *op. cit.*

Fiscal autonomy of local school districts is restricted or broadened by many other fiscal arrangements of the state. These include (a) legal limits on the use of tax sources by education and other governments, (b) state financing of education or other governmental services by grants, and (c) state performance rather than local operation of certain governmental services. Careful empirical analysis of the effects of these varied combinations is necessary for full development of the topics. They are mentioned only because as yet empirical analysis, possible since the 1957 Census of Government, has not been done.

Fiscally dependent school districts have greater access to nonproperty tax revenue than fiscally independent school districts. It has been estimated that in 1957, fiscally dependent schools received four times as much nonproperty tax revenue as fiscally independent districts.[9] This arises because noneducational governments, notably cities, have been granted power to use nonproperty taxes on the local level while schools, with the notable exception of Pennsylvania, have not. This means that school districts with similar legal definitions of fiscal independence in two states may have quite different actual situations. Within a state, the types of property in the local school district tax base create variations in actual local power.

J. Alan Thomas [10] finds a difference in local financing and citizen attitude toward supporting schools between school districts with only residential property and those with large amounts of industrial and commercial property in their tax bases. Other variations have not yet been empirically studied. Empirical study of the varied patterns that exist and their influence on the amount of resources available is a necessary first step in determining whether schools are better off at one point rather than another on the fiscal dependence-independence continuum.

Limits on fiscal independence—Local decision making for schools requires discretionary spending, which, in turn makes unrestricted funds necessary. Unless past decisions are to hamper local control unduly, long-range planning for decisions under changing conditions is essential. Even though fiscally independent, a school district operating within the constraint of known revenues, must consider in its budget-making process the total needs of the public sector and the social, economic, and political forces of the community and state. This constraint especially affects large cities and poor school districts. The constraint differs by objectives for education and by population served. There are funds for goals such as education for the world of work or education for social objectives like integration when funds may not be available for education for its own sake.

If these views of the present are correct, fiscal independence differs widely within a state and among states, and may be important only for a small group of school districts. Others have raised this same question. A Committee for Economic Development report indicates that only in 23 states are districts sufficiently large for educational efficiency and quality and that this was achieved by state fiat.[11] In other words, voluntary efforts for consolidation failed to achieve efficient district size. Symbols of local control seem of greater importance to voters than the quality of education and the efficiency of district operation.

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[9] Alford, Albert L. *Nonproperty Taxation for Schools.* U. S. Department of Health, Education, and Welfare, Office of Education, Bulletin 1964, No. 4. Washington, D. C.: Government Printing Office, 1963. 144 p.

[10] Conversations with J. Alan Thomas about current doctoral dissertations at University of Chicago.

[11] Committee for Economic Development. *Paying for Better Public Schools.* New York: the Committee, 1959. p. 71.

The symbols of both local control and actual control were lost to school districts in California owing to the specification by the California Legislature of (a) reading objectives for pupils by the end of third grade, and (b) pupil-teacher ratios for these early elementary grades. In part, past poor allocation of resources within local school districts and the number of small districts may have influenced these decisions. The legislature did not question providing funds for schools but did question the use made of the funds.

If fiscal independence is important, local boards must be responsive to needs as Firman indicates.[12] The conceptual framework for fiscal independence must include school districts of efficient size. School officials must be concerned with the efficient use of resources, and the objectives for which resources will be used. The important task is not preserving the symbols of local control but increasing the rationality of local decisions when viewed in the context of the general welfare of the total society.

Fiscal Independence—Future

Fiscal independence means local control and responsibility for education by lay boards and citizens of the community. As part of a total conceptual framework which relates the states to local schools, fiscal independence is valuable. By 1967, many parts of the traditional conceptual framework have disappeared in fact, and remain only in theory. The experience of the past and an evaluation of the present may indicate the direction for the future. Specific aspects of the present and past to which attention should be directed are (a) the major question of whether education should go it alone or in partnership with other public services; (b) the related question of whether parts of education should go their separate ways or together; and (c) the question of how much the social, economic, and political forces limit local choices. These questions now have a new urgency. They might have been ignored in the past, but in the future they can hardly be ignored. It will be increasingly difficult to avoid facing the problems posed by these questions. Three developments which are related to these questions and which will affect fiscal independence in the years to come are packaged educational systems (PES), programming-planning-budgeting systems (PPBS), and teacher negotiations.

Packaged educational systems (PES)—School finance research has been criticized for concentrating on process and ignoring product. The product of the schools has now caught attention and many tools of analysis, such as input-output and cost-benefit, concentrate on this aspect.

The time may be upon us when process and product are so interwoven in a packaged educational system (PES) that separate decisions about process and product can no longer be made. PES's are being developed by the education business concerns, regional laboratories, universities, or other groups. All of these groups sincerely state that they are not interested in determining objectives for education; they intend to develop equipment and PES's for objectives educators give them. An illustration of a simple decision, such as the attendance at a national conference, shows how process and product become mixed; and how there is little or no difference between objectives and alternative equipment or PES's.

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[12] Firman, William D., *op. cit.*

Theoretically, one could survey the alternative methods of arriving in St. Louis. One could decide to come by car, bus, train, plane, or even bicycle or foot if one so desired. If the conditions of an afternoon session and location at a distant point on either coast are added, the decision most probably hinges on the availability of air transportation. This may not be so if one's time has a low price or if one can obtain other objectives by the trip. One might take a vacation, visit relatives, or see other places or people on a trip by car or train as well as by plane. The combining of objectives may mean that more alternatives are available. PES developers will provide an integrated means-end product to meet certain limited objectives. PES's will permit more flexibility in programs as the airplane permits a person living on either coast to attend an afternoon session in St. Louis. However, PES's will also restrict choice to the objectives for which they are especially designed.

Certain objectives and tasks become possible because the means are available; without the means, the task could not be done. Individual pupil learning becomes more possible with methods such as computer-assisted instruction. Classroom teaching rather than tutoring became possible with the production of textbooks. Nevertheless, alternatives for some objectives are limited, and choices can become limited to available objectives, or to a weighing of their relative importance. PES's mean that decisions about many aspects of the educational enterprise will be made at once and not separately.

Development of PES's, and their production for some objectives and not others will limit the choice about which objectives may be served. Support for language laboratories may have meant that oral instruction, listening, and speaking a language have been emphasized to the detriment of grammar, literature, reading, and writing of the language. A PES for a target population may mean more attention to that population than to other pupils, whether or not such attention is required, or beyond the period when it is appropriate. PES's also attain new importance as research itself is turned on governmental decisions in the programming-planning-budgeting system (PPBS) context.

Programming-planning-budgeting system (PPBS)—Not only educators themselves but also central decision-makers, such as governors, mayors, and legislators, will be evaluating educational outcomes and costs.[13] They will be looking at schools in terms of manpower needs, contributions to economic growth, and social objectives as well as with the traditional viewpoint of school officials. The forthcoming widespread adoption of PPBS as a management tool creates a new climate for all government and in some special respects for education.

Regardless of whether PPBS is viewed as a tool for decision makers, as a set of rules for discussion, or merely as a means of taking a longer view of present action, its utilization will greatly affect the allocation of resources to programs within the public sector, including, obviously, the uses of available resources by schools. To a degree, PPBS establishes standards of performance which require subordinate administrators to evaluate output of resources used, or to face the possibility of an unfavorable comparison with similar units elsewhere. If grant programs from state or federal governments are introduced, the comparisons may become part of the grant operations.

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[13] Annual Report of the Council of Economic Advisors, January 1967.

Within PPBS, central decision-makers and their subordinate heads of functions or departments will want to know:

1. Which other programs benefit from the spending of funds.
2. For which other programs the particular program could substitute.
3. Which other programs the program under consideration complements.
4. Which other programs are more expensive because of this particular activity.

Answers to the first three questions help make the best case for maximum funds, and the answer to the fourth helps, one avoid being caught unaware by arguments against one's own program. All of these answers should result in "more bang for the buck," and should provide citizens with more information upon which to make a decision. Alternatives for achieving an objective may be explored by other coordinate agencies, or central decision-makers; thus, one's view *must* broaden to the role of one's operation within total government functions.

PPBS will lead to more attention and concern being directed to educational decisions by others. Available PES's may be bought not by educators but by others to perform tasks which they believe have a low priority with educators. Some aspects of education may have comparatively greater importance only from a viewpoint outside education. A specific educational purpose can have a different value to a central decision-maker, a welfare administrator, or other nonschool administrators than it does for a school administrator.

Education may become valued for those parts which can be quantified, and it may become the alternative use for other similarly quantifiable programs. Education has become a good business, a good social tool, a good investment, and good politics, and herein lies danger. Education has become very useful as a means to other goals. Many persons may value education for these tangential outcomes, and it could be valued only for these results.

There is the possibility that fragmented portions of the educational program or partial objectives may be supported better than the total program or global objectives. Progress by educators is necessary in developing lines of thought and communication with many others. Otherwise, educators may lose salable portions of the educational program with well-defined objectives and identifiable and measurable outputs while retaining only the least defensible portions (least defensible in the terms above).

Illustrative of the last point is vocational education. If one compares vocational education with on-the-job training as preparation for the world of work, almost any over-all comparison will result in on-the-job training being better as long as vocational education pursues a program with great emphasis on agricultural courses and similar activities. For certain jobs in which experience is important, in which specialized or recently developed, or very costly equipment is used, comparisons between on-the-job training and vocational education would also yield poor results for the latter. Not only vocational education but all education may be forced to examine the limits of the task undertaken, and recognize where other agencies can better perform parts of the educational program. Attention must be given to the best use of resources by various agencies for a given goal.

Teacher negotiations—It is commonplace to cite agricultural research to indicate the benefits which an industry of small, scattered producers can achieve from a central research operation to encourage research for education. It may become commonplace to cite the experience of the trucking industry and negotiations with Hoffa and the Teamsters as the prototype for developments forced on education by teacher negotiations. Education like trucking is not organized nationally or regionally. Union negotiators in both instances have a remarkable knowledge of the operations, a knowledge that often exceeds that of local board members and even local administrators. In each instance, the union has the advantage of comparing different conditions and situations and automatically building on its experience. The scatter producers in either trucking or education have no such mechanism. Rules, regulations, and working conditions agreed to in bargaining or through a grievance procedure are automatically enforced through local members. Conditions established in one area are quickly applied to others.

Of the developments for the future, teacher negotiations may take the longest time but potentially give the most difficulty. Many established practices and attitudes will be affected directly. Instead of an education profession composed of teachers and administrators, teacher negotiations call for a labor and management partnership in which many questions will be asked of management. Conceivably, the push by teachers could unite administrators and boards in a common front against the "enemy." Such a solution would probably pass the battle into the community, or beyond the community to other decision-makers.

Teachers may be joined by other equally militant public servants. School administrators and school boards must learn labor negotiations, a field that is new to them. The American Federation of Teachers is drawing upon the history of labor relations, and the Department of Classroom Teachers of the National Education Association may not be far behind, if at all, in applying the lessons. Teacher negotiations will provide more information for citizens, law-makers, and decision-makers, especially those outside education. Data and information used may remain the same as that used by others, but new interpretations will undoubtedly appear.

Teacher negotiations are important for fiscal independence because they concern almost all of the school budget. Decisions made as part of negotiations and grievance procedures may well determine the school spending program. Appeals against adverse decisions can also create new lines of authority and power within the school district and beyond the school district. After local school officials have been approached, local political leaders and other local leaders can be enlisted for support if requests are denied. Requests can continue to state and national levels if all local requests fail. Laws like the Davis-Bacon fair employment requirements for construction could be applied by the federal government to other than construction grants. State governments could be encouraged to pass laws for similar purposes.

Teacher negotiations will call for definition of a full-time teacher, the working conditions of schools, and the material support as well as salary. A voice for the teacher in all decisions will add another viewpoint. Nationally organized negotiations will mean more uniform standards among school districts in the area of personnel. Choices of local boards will be limited unless they develop appropriate mechanisms to cope with the changing situation.

Can Local Control Survive?

Is fiscal independence important enough to merit consideration within the future developments described? Change comes from either funds or ideas. The danger of losing local control comes from having neither funds nor ideas. Not all funds nor all ideas need to originate locally. Yet localities need to be perceptive of change and meet the changes with action. Action requires funds. PES's are making education more capital intensive; PPBS is making educators more aware of output and resources used; teacher negotiations are imposing more uniform working conditions and salaries. Looking ahead to these developments which will unfold variously in states and localities, local school boards will need to plan for the world of change.

Steps for conditions of a changing world must be grasped, understood, and applied for fiscal independence of a local school board to have meaning. One needs to ask "how to play the game," and not "whether the game should be played." As a means to obtain unrestricted local funds, fiscal independence is one way; a percentage of amounts in all grants being unrestricted is another. New relationships between educators and others must be built. Exclusive attention to formal structure and symbols like fiscal independence will let others outside education decide the new structure.

No one knows whether fiscal independence for education has worked well or not. To determine whether fiscal independence for education gives necessary benefits in the world today is an important research task. To discover advantages tomorrow may be more difficult. The practical tests of Firman [14] for fiscal independence will not be sufficient in emerging conditions. Nevertheless, fiscal independence as part of local control seems worth preserving. To preserve it, rational determination of the extent of fiscal independence is needed. The determination should consider the benefits to education and to the community at large, including the other public services and the welfare of the citizens. The determination must extend beyond the present to examine the context in which fiscal independence will assure local control in a future unlike the present.

In an oversimplified view of the past, the local school district and the local school were the site for all the functions of education. The local school did some research, teacher training, and development of new ideas as well as provide all kinds of instruction. Today, these educational tasks have been specialized and other organizations do most, if not all, of the tasks besides instruction. Instruction has also been increasingly specialized as other organizations educate newly defined subpopulations. Policy questions are not framed in terms of formal organizations of the education structure but in terms of education. The question is no longer how should schooling be accomplished within the schooling organizations but what processes will achieve the desired output of an educated individual. Whether one speaks of Head Start, Job Corps Centers, on-the-job vocational education, or a host of other activities, one is speaking about the education process and its contribution to individual development, not about schooling and its contribution. The formal schooling organization and its tasks are often no longer of concern in the broad questions being posed.

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[14] Firman, William D., *op. cit.*

As long as educators speak about the formal schooling organizations, they tend to stay outside the mainstream of present policy discussions. Speaking of fiscal independence is only a single example of educators speaking to each other but to no one else. Placing fiscal independence within the broader context of present concerns will assure educators of a voice in future developments. The task of relating the formal schooling organization to others concerned with education is not easy; it is not a wholly new task; and it can be done with an awareness of future developments.

The changes portrayed for schools in the future are no different than the changes that other groups in society have faced in the past, or will face in the future. Education, especially higher education with related research, has been responsible for many of the changes. What is new currently is that education is faced with research being turned upon education itself. In education there has been a change from the one-teacher, one-room school to schools of today. In medicine the concept of the general practitioner has changed from a lone practitioner to one supported by hospitals, medical centers, medical laboratories, specialists, and organizations like Blue Cross, Blue Shield, and the Medical Bureau. The general practitioner uses many organizations and specialists to accomplish his task. Often, he is merely the referral agent for specialists. He performs better service than in the past, but his role is more limited.

The local school district may also become more limited in its role of instruction. It may become the referral agent for specialized instruction and for instruction requiring specialized expensive equipment. These tasks may be done by supplementary education centers. Local school districts may need to develop organizations to assist them in their tasks as medical associations assist the general practitioner.

Rational use of resources for well-defined objectives is the key to maintaining fiscal independence in the future. PES's will provide capital-intensive methods for particular objectives but not all the objectives of schools. PPBS will provide a framework for comparing the cost of reaching certain objectives as well as the cost of varied methods to the objectives. Teacher negotiations will constrain personnel policy and utilization but likely lead to additional formal rules and regulations which are more uniform nationally. All three factors provide for better use of resources yet decisions vastly different from those made today in local schools. If the rational use of resources, or the objectives for which resources are provided, is ignored, fiscal independence can hardly be maintained. On the contrary, if all decisions on schools are not to pass to others, fiscal independence is vital.

To achieve a proper middle course between these extremes is the challenging task of local and state school boards, local and state officials, and all concerned with local control.

Knowledge of developments in the period ahead is important. Communication with others interested in schools, the product of schools, and education generally is also vital. Legal responsibility will be actual responsibility only if local schools respond to educational needs and if they forestall attempts to meet each and every need society may place upon the schools. This is especially necessary when social needs conflict with the good provision of education. Failure of the schools to meet the pressing needs of society will find society placing little or no value on the purely educational needs.

Schools have always served a dual function in society: one as an agent of change, the other as an agent for conserving. This dual function is best illustrated by college campuses which have both research facilities, and libraries and museums. Fiscal independence helps to preserve the dual function. Yet without other supporting organizations and even unrestricted state and federal funds, local fiscal independence may not be able to accomplish this dual function in the period ahead. Analytical resources of personnel and techniques to evaluate and choose among the many outside pressures, provides the way to and the practical test of fiscal independence in the near future. Limited funds for this purpose are also required; however, the capability of the staff is more important than the funds. Fiscal independence may have as its single dimension the quality of local staffs to perform analytical tasks and not access to local tax sources.

The Cost-Quality Relationship

Austin D. Swanson

INTEREST IN THE STUDY of relationships between cost and quality in education is of long standing. Ellwood P. Cubberly, credited with being the father of the study of educational administration as a discrete discipline, noted in 1911:

> Of these [norms of expenditure], we know almost nothing today, and the variations between school systems on different items of cost are very large—too large to be explained on a basis of varying degrees of efficiency. While a certain latitude as to expenditure must always be allowed for between different school systems, the introduction of business methods of estimating and auditing expenditures cannot help but be of service. There can be little doubt but that there are at present many unrecognized financial wastes in the administration of our schools, county and rural as well as city and town, which a study of costs will reveal and correct; and there also can be little doubt but that there is much very unwise expenditure which a comparative study of units of expenditure will lay bare. The purpose of all such studies is not so much to reduce total cost as to secure greater returns from the money expended. . . . It is one of the most important administrative problems now before us.[1]

Over half a century later, determination of cost-quality relationships in education is still one of the most important administrative problems before us. Progress in the study of these relationships has been at a painfully slow rate. Indeed, our net progress has been substantially less than that made by our colleagues in business and industry; but our problem tends to be much more complex than theirs.

Cost-quality analysis brings to mind other terms such as *operations research, optimization, efficiency,* and *systems analysis*. There are those who object to the application of such concepts to the analysis of educational institutions because their principal objectives are social, not economic. Professor Alan Thomas has responded nicely to these objections by saying:

> These reservations result from the problems which are involved in applying to one field of endeavor (in this case, education), methods of analysis which were developed for a different purpose. Certainly, the method of applying the concept must vary according to the nature of the problems which are being examined. Yet the pursuit of efficiency, or the effort to reach a set of objectives at the lowest possible cost, is characteristic of most of man's endeavors.[2]

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[1] Cubberly, Ellwood P. "Fundamental Administrative Problems." *Research Within the Field of Education, Its Organization and Encouragement.* Chicago: University of Chicago Press, 1911. p. 5.

[2] Thomas, J. A. *Efficiency Criteria in Urban School Systems.* Unpublished paper read at the 1967 Convention of the American Educational Research Association, New York City.

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In this spirit I plan in this paper to develop a conceptual framework within which educational cost-quality problems may be studied, to review some of the research which is our heritage, and to project some new directions for study.

General Input-Output Model

The term *cost-quality* implies *input-output*. A good place to begin the development of a conceptual framework for educational institutions is with a general input-output model. Such a model is shown in Figure I.

The input variables are of two kinds: those that may be controlled by the organization (decision variables) and those that are beyond the control of the organization (environmental determinants). Input variables pass through a process of "interaction," where some sort of end product, "output," results.

Applications of this model to the analysis of input-output relationships in school districts are of at least four types. They are classified according to the scope of the interaction studied and according to the types of output variables used as shown in Figure II. Output can be viewed as services produced by the school system (C and D) or in terms of the system's impact upon the learning of its charges (A and B). This paper will focus on the second classification of output variables because it is more closely related to the *raison d'être* of the schools.

The interaction function of the general input-output model may be analyzed for either the total system (B and D) or for subsystems (A and C). The subsystem approach focuses on specific aspects of the total problem and may yield more immediately usable results, considering the state of the science, than the total systems approach. But it does not provide any decision guides for allocating resources among subsystems. The total systems approach does provide allocation guides, but the complexity present in a total system handicaps the practical application of this analytical technique. Fortunately we are not faced with an either/or proposition. Research concerning input-output relationships should make use of both approaches depending upon the nature of the problems under study.

Educational Program Input-Output Model

Application A of the general input-output model, the subsystem approach with an educational effect output criterion, has been suggested by Kershaw and McKean.[3] This approach permits a school district to test alternative approaches to specific objectives. For example (using an illustration similar to that used by Kershaw and McKean), a district may have $150,000 for the purpose of improving pupil achievement in its elementary self-contained classrooms. With this amount of money it can raise teachers' salaries 5 percent, or it may lower the pupil-teacher ratio by 8 percent. (There are many other options, but we will focus on these two.) Which is the better choice? The answers are suggested in Figure III.

The output measures in Figure III are hypothetical, but it does not take too much imagination to envision them in the real world. Both alternatives result in better pupil achievement, but the greater yield comes from increasing the salaries of teachers. On the basis of the evidence presented, this is the wiser choice.

Application C of Figure II also focuses upon a specific subsystem, but

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[3] Kershaw, Joseph A., and McKean, Roland N. "How To Make School Decisions: An Outsider's View." *School Management* 4:67-69, 118, 121; May 1960.

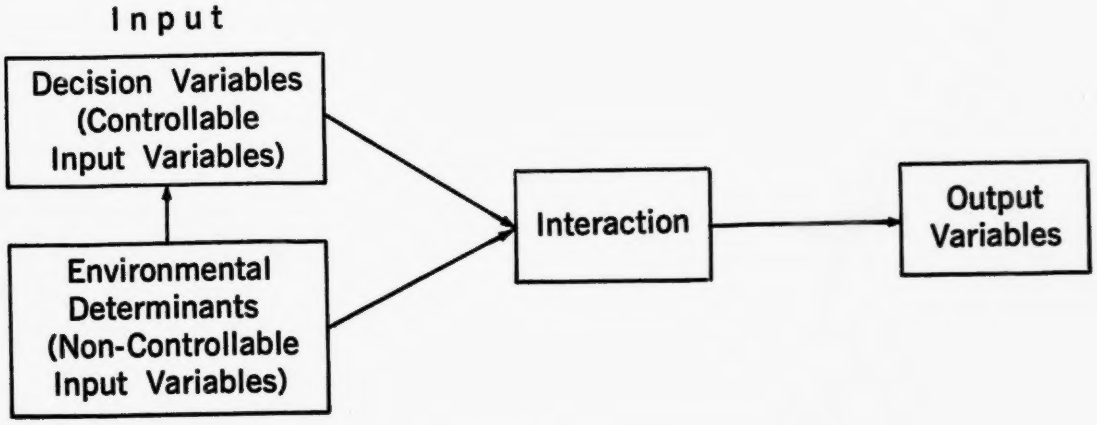
Input
Decision Variables (Controllable Input Variables)
Environmental Determinants (Non-Controllable Input Variables)
Interaction
Output Variables

Figure I. General Input-Output Model

		Scope of Interaction Studied	
		Subsystem approach	Total system approach
Output Variables	Measured in terms of educational effect on children	A	B
	Measured in terms of services provided	C	D

Figure II. Types of Application of General Input-Output Model to Educational Problems

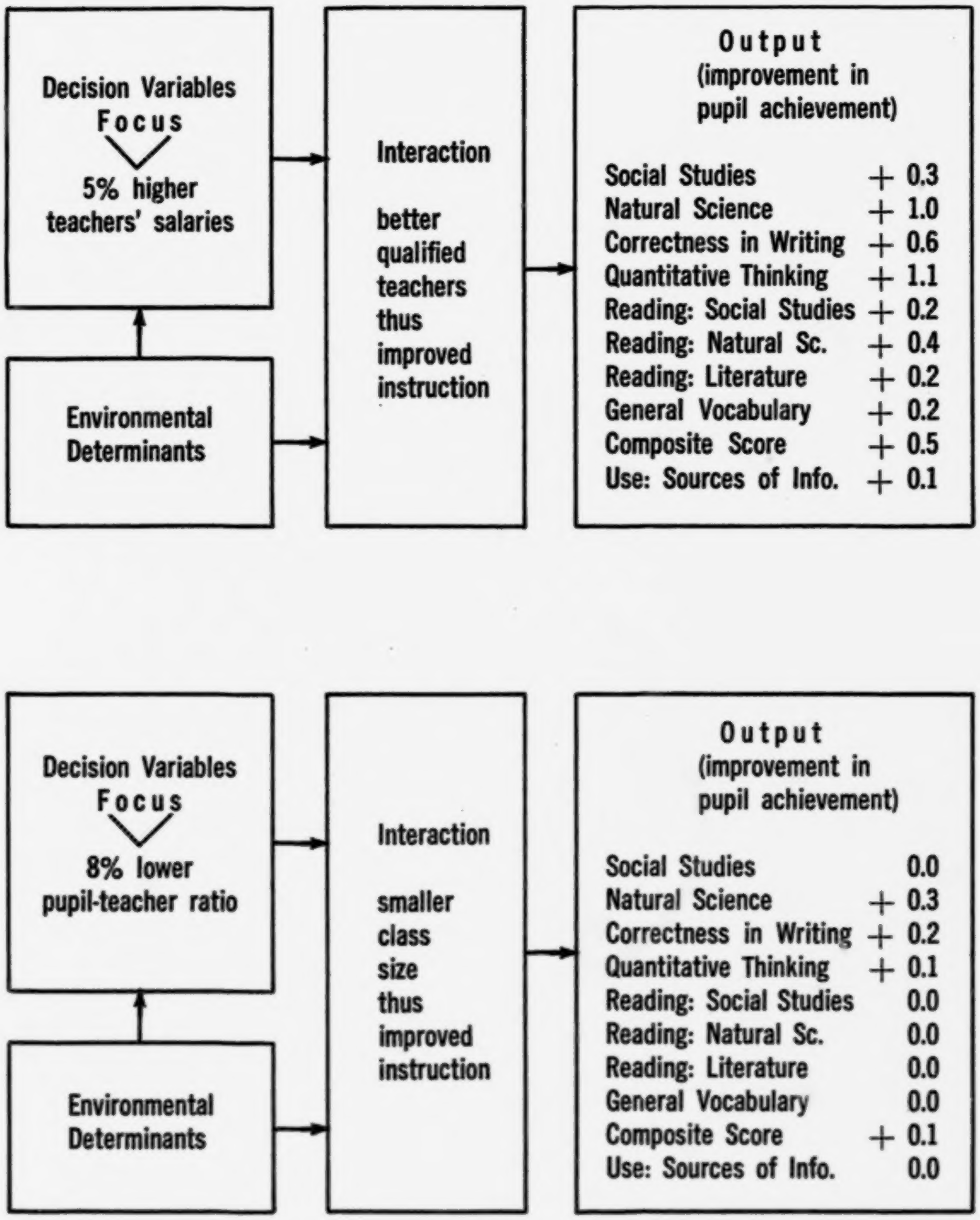
Decision Variables
Focus
5% higher teachers' salaries
Environmental Determinants
Interaction
better qualified teachers thus improved instruction
Output
(improvement in pupil achievement)
Social Studies + 0.3
Natural Science + 1.0
Correctness in Writing + 0.6
Quantitative Thinking + 1.1
Reading: Social Studies + 0.2
Reading: Natural Sc. + 0.4
Reading: Literature + 0.2
General Vocabulary + 0.2
Composite Score + 0.5
Use: Sources of Info. + 0.1
Decision Variables
Focus
8% lower pupil-teacher ratio
Environmental Determinants
Interaction
smaller class size thus improved instruction
Output
(improvement in pupil achievement)
Social Studies 0.0
Natural Science + 0.3
Correctness in Writing + 0.2
Quantitative Thinking + 0.1
Reading: Social Studies 0.0
Reading: Natural Sc. 0.0
Reading: Literature 0.0
General Vocabulary 0.0
Composite Score + 0.1
Use: Sources of Info. 0.0

Figure III. Application of General Input-Output Model to Two Alternatives for Improving Instruction in Self-Contained Elementary Classrooms with Cost Increases Constant

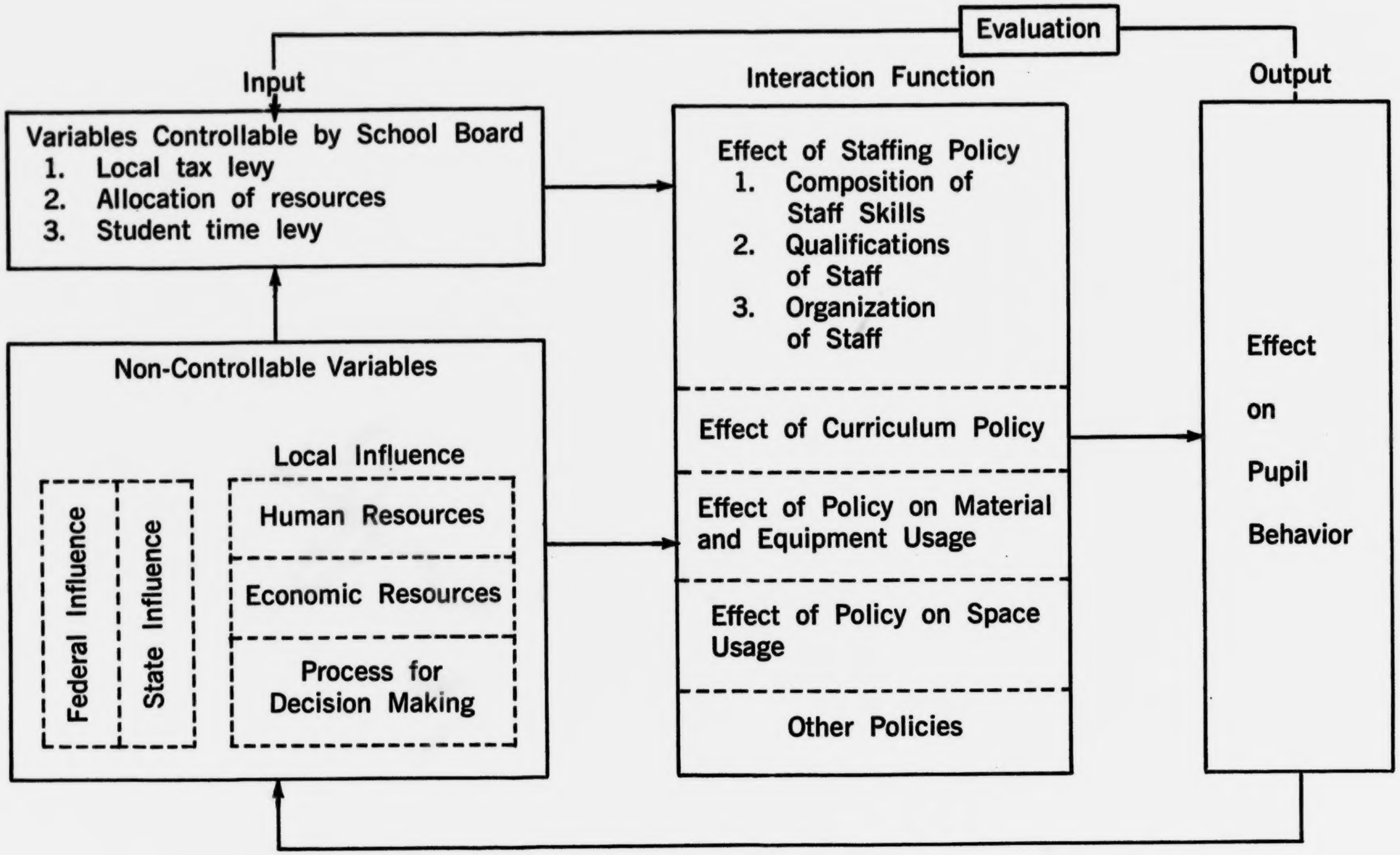
Evaluation
Input
Interaction Function
Output
Variables Controllable by School Board
1. Local tax levy
2. Allocation of resources
3. Student time levy
Non-Controllable Variables
Federal Influence
State Influence
Local Influence
Human Resources
Economic Resources
Process for Decision Making
Effect of Staffing Policy
1. Composition of Staff Skills
2. Qualifications of Staff
3. Organization of Staff
Effect of Curriculum Policy
Effect of Policy on Material and Equipment Usage
Effect of Policy on Space Usage
Other Policies
Effect on Pupil Behavior

Figure IV. School District Input-Output Model

instead of using pupil achievement criteria, an evaluation of the quality of services is used. This is perhaps the most common type of quality analysis. Frequently a school district will invite an "outside expert" to examine a particular program (for example, guidance) and to evaluate it against some standard, often the expert's own opinion. School districts also commonly make self-evaluations, using as a standard an independently published list of criteria or district generated criteria.

The potential applications of these analytical techniques are numerous. Their use is facilitated by program budgeting.

School District Input-Output Model

Despite its complexity, the value of the insights to be gained from application B of the general input-output model, the total systems approach with an educational effect output criterion, compels us to apply some of our talents in this direction. The model portrayed in Figure IV represents an attempt by this author to graphically describe the relationships among variables involved in cost-quality analysis of local school districts. It contains many of the elements of Mort's Sequential Simplex.[4] It might be classified by Thomas as a model of his "Educational Psychologist's Production Function."[5]

Non-Controllable Input Variables

Research, to be cited later, has shown that the non-controllable input variables have a sizable impact upon the educational output of educational systems. Some writers suggest that these are probably more important in influencing educational output than are the variables under the control of the school board and the administration.

Non-controllable variables include the influence of the local community, of the federal government, and of the state government. I would hypothesize that the influence of the federal and state governments has been growing, but not to the point where it has surpassed the influence of the local community. The "local influence" has been subdivided into three subcategories: human resources, economic resources, and the decision-making process. State and federal influence could be similarly characterized; but for reasons of simplification and because of their hypothesized lesser impact, they are not treated here.

Human resources of the local community that affect output include the size of the community, educational level of the population, the kind and distribution of work skills among the population, and the tradition of the community with respect to education. These combine to establish a community attitude toward the public schools. Mort encompassed this phenomenon within the terms *community* and *educational climate*.[6] James, Kelly, and Garms have recently described it as *expectations*.[7] Even with great economic resources, a community will be handicapped in making adequate financial provisions for its schools if its people do not hold high expectations for the schools. Generally communities of well-educated business and professional people hold an attitude more conducive to achieving high educational output than communities of poorly educated blue-collar workers.

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[4] Mort, Paul R., and Furno, Orlando F. *Theory and Synthesis of a Sequential Simplex*. New York: Institute of Administrative Research, Teachers College, Columbia University, 1960. 104 p.

[5] Thomas, J. A., *op. cit.*

[6] Mort, Paul R. "School and Community Relationships to School Quality." *Teachers College Record* 55:201-14; January 1954.

[7] James, H. Thomas; Kelly, James A.; and Garms, Walter I. *Determinants of Educational Expenditures in Large Cities of the United States*. U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 2389. Stanford, Calif.: Stanford University, School of Education, 1966. 198 p.

Children of school age constitute an important human resource. These, of course, are the principal input of the school system. Public schools have virtually no control over the selection of the pupils with whom they will work. Therefore, the nature of the interaction function should be largely determined by the qualities of the pupil input which is also highly correlated with the socioeconomic level of the community.

Economic resources of the community fall into two categories, those accessible to taxation by the school board, usually real property, and those not accessible but which facilitate the payment of such taxes, principally personal and corporate income. The nature of human resources determines the demand or the willingness to pay for education. The expected services cannot be supplied, however, unless the resources to pay for them are available.

Perhaps we know least about variables in the third subcategory, process for decision making. Several researchers have hypothesized that this process does make a difference, but supporting evidence is meager. This subcategory includes such factors as the means for selecting a school board, its taxing powers, its budgetary powers, the relation between the business and instructional functions of the board, and the geographic boundaries of the school district.

The net effect of the local influence upon the output of a community's school is strongly and directly related to the general socioeconomic level of its population. The variation among communities in this characteristic is great. Therefore, if left solely to their own devices, the effectiveness of school districts would also vary greatly. Through the resources and control devices at the state and federal levels, the variation in output is moderated, but not eliminated.

Although the human and economic resources and the decision-making process are not subject to manipulation, the decision-makers (school boards and administrators) must take these variables into account in making their decisions. Investigators of input-output relationships must statistically control these variables through appropriate research designs.

Controllable Input Variables

The controllable variables are of more interest to our immediate problem. They are factors we can do something about within the constraints of the non-controllable variables. Controllable variables are divided into three categories: local tax levy, allocation of resources, and levy on student time.

The school board translates the willingness of the people to pay for public education into a tax levy. The board is constrained in this act by certain subtle and other obvious conditions. The most powerful subtle condition is the fact that the board is selected through varying processes by and from the community. The board, therefore, is likely to reflect strongly the thinking of the community. If the board strays too far from community expectations, it will gradually be replaced by the electorate. Obvious constraints are state constitutional tax limits, budget review by another governmental body, and, most important, the size of taxable resources. Within these rather severe constraints, the school board has only a narrow band of discretion in establishing the local tax levy.

The local levy plus state and federal aid constitute the bulk of economic resources available to school boards for operating the school districts. School boards have substantial discretionary powers in the allocation of these resources to the interaction function. The magnitude of these resources and the skill with which they are allocated in turn affect the nature of the educational output.

The final category of controllable variables is the levy made on student time. The school board has considerable discretion in the use of student time; however, until recently this has not been viewed as an economic commodity. Schultz has pointed out that this is a valuable input into the educational process.[8] This category would involve decisions as length of school day and school year and number of school years required for meeting stated objectives.

Interaction Variables

The non-controllable variables affect the decisions made about the controllable variables. Both categories of variables make direct contributions to the interaction function. In business and industry much evidence exists as to the important effect of variations in the allocation of resources in the interaction function upon output, and there is some evidence of this within the educational context.

Since relationships have been discovered between expenditure per pupil and measures of educational output, it is not too surprising that similar though weaker relationships have been found between expenditures for specific services and output. These include the level of professional salaries, number of professionals per 1,000 pupils, provisions for supplies and other educational equipment. The research on items of this nature generally has not looked at the problem of mix which, as the name implies, is the principal focus of the interaction process. Specialization has led to the necessity of making decisions concerning the mix among the various professional and semiprofessional skills available: classroom teachers, special subject teachers, teacher aides, teacher interns, psychologists, guidance counselors, and administrators. The level of qualification of a staff has been a concern of long standing, involving such factors as the length and quality of training or experiences.

The dominance of the self-contained classroom is yielding to other types of organizational patterns such as large group and small group instruction and team teaching. With this has come new patterns of space utilization. Educational technology is beginning to blossom. The textbook has been supplemented with radio, film, television, programmed instruction, and computer. The complexity of the educational interaction function is rapidly increasing. The challenge of its analysis remains unanswered. An analysis could reveal answers to such questions as:

Through what process does input influence output?

How can maximum output be achieved from a given input?

How do variations in the input of children affect the educational process in order to realize optimum output?

How do varying degrees of constrained resources influence the optimum educational process?

Educational Output

The final panel, educational output, is the simplest to explain but the most difficult to measure. It is the net result of the input variables combined for better or for worse in the interaction function. The output has a direct effect upon community resources (non-controllable variables) and through the evaluative process should also have a direct effect upon decisions made concerning the controllable variables.

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[8] Schultz, Theodore W. *The Economic Value of Education.* New York: Columbia University Press, 1963. 92 p.

Related Research

Research into the nature of cost-quality relationships has not advanced as dramatically as it has in business and industry. This is largely due to the difference in the nature of the variables of the two activities. A substantial portion of the variables of business and industry are easily quantifiable. Many inputs can be measured in dollars, pounds, or hours; most outputs can be measured in dollars. In education, some inputs may be measured in dollars, but the dominant input is children of differing characteristics and without an assigned economic value. Educational output cannot be measured in terms of dollars, but must be measured in terms of the institutional impact upon the behavior of the persons who have passed through the institution. Not only do the characteristics of these persons differ to begin with, but so does the extent of their exposure to other educational experiences in institutions other than that under study. Thus, an important aspect of the research relevant to cost-quality analysis has been the development of units and scales.

Research into cost-quality relationships, going back at least 30 years, has dealt with the direct relationships between input variables and output variables. The interaction process has been largely ignored, treated in a "black box" fashion. Many of the findings have been noted, but not cited, in the development of the school district input-output model.

In New York State, the Regents' inquiry of 1938 analyzed cost-quality relationships and noted, "High educational efficiency is not achieved without high expenditure, but many districts have high costs and distinctly inferior returns."[9] The study showed that the best schools surveyed were high-expenditure schools primarily because they paid high salaries. Schools with average educational results tended to spend average amounts of money, low-cost schools were generally low-achievement schools.

One of the first studies into the relationships between cost and quality was conducted by Paul Mort and Francis Cornell in 1936 in Pennsylvania.[10] Probably the most startling finding was the strong impact of community characteristics upon the magnitude of financial provisions for schools, and upon their quality (measured by a process-type instrument). The relationships found in Pennsylvania some 30 years ago for a cross section of communities are strikingly similar to those found recently by James, Kelly, and Garms in a study of large city school districts in the United States.[11] The Pennsylvania studies pointed out the limit on discretionary powers of local school boards and school administrators in the resolving of their communities' educational problems. It also pointed toward the need for financial support and general supervision of local communities by state authorities if the educational services of certain communities were to be improved.

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[9] Grace, A. G., and Moe, G. A. *State Aid and School Costs*. New York: The Regents' Inquiry, McGraw-Hill Book Co., 1938. p. 324.

[10] Mort, Paul R., and Cornell, Francis G. *American Schools in Transition*. New York: Teachers College, Columbia University, 1941. 546 p.

[11] James, H. Thomas; Kelly, James A.; and Garms, Walter I., *op. cit.*

The Pennsylvania studies were the first of a series of investigations that continued under Mort's supervision at the Institute of Administrative Research, Teachers College, Columbia University. They were characterized by process criteria and by a total system approach (Type D in Figure II). Subsequent to the findings of the Pennsylvania study, community situational factors were controlled through a multivariant technique known as the Sequential Simplex.[12] This series uncovered scores of factors related to the quality of the school process, e.g., net current expenditure per pupil, average teacher's salary, professional-to-pupil ratio, small-item expenditure per pupil, clerical per-pupil ratio, and professional specialist per-pupil ratio. These relationships were generally assumed to be linear with no discernible point of diminishing return.

The Mort studies also showed that more money did not purchase more of the same thing, but permitted development of new aspects of education. Although high-expenditure schools generally do a better job of teaching the basic skills and in inter-relating areas of knowledge, they far excell their low-expenditure counterparts in individualizing instruction, in developing special talents of children, and in using teaching processes designed to develop creativeness in children, ability to think critically, and ability to solve problems.

Many of the studies that have shown the basic relationship between expenditure and measures of school output have not been conducted by students of school finance but rather have been by-products of other studies.

As a result of achievement tests given by the Armed Forces during World War II, some interesting discoveries of cost-quality relationships at the state level have been made. For example, Bloom in 1955 used the Armed Forces General Educational Development Test as a criterion.[13] He noted a marked variation in the general level of achievement by residents of the various states. There was a strong tendency for men educated in high-expenditure states to achieve better. The correlation found between expenditure and achievement by Bloom was .75. A similar analysis was made by Ginzberg and Bray.[14] They noted that 5 out of 7 rejectees during World War II came from the 12 lowest-expenditure states.

The New York State Education Department has been conducting a quality measurement project for nearly a decade.[15] The initial study, beginning in 1957, involved a sample of approximately 100 school districts in New York State. Quality was measured by using achievement test scores for four consecutive years. The effects of intelligence and socioeconomic origin upon achievement were statistically neutralized. Seventy thousand pupils participated in the testing. A comparison was made between the 12 school districts that were almost universally good and the 12 districts that were almost universally poor. The good districts spent approximately 25 percent more than the poor districts, which at that time amounted to $150 per pupil. The good-quality districts put forth greater local effort than the poor-quality districts. The median tax rate for the high-quality districts was $14.90 per $1,000 of full value compared with $11.73 in the low-quality districts. The good districts had considerably more full valuation per pupil than did the poor-quality districts. The good districts hired about five more professionals per 1,000 pupils than did the poor-quality districts. The salary schedules of the good districts were better than those in the poor districts, although the average teachers' salaries were not higher. The teachers of the good-quality districts were more widely traveled, younger, better trained, and were recruited from a wider area.

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[12] Mort, Paul R., and Furno, Orlando F. *Theory and Synthesis of a Sequential Simplex.* New York: Institute of Administrative Research, Teachers College, Columbia University, 1960. 104 p.

[13] Bloom, B. S. "The 1955 Normative Study of the Tests of General Educational Development." *School Review* 64:110-24; March 1956.

[14] Ginzberg, Eli, and Bray, Douglas W. *The Uneducated.* New York: Columbia University Press, 1953, 246 p.

[15] Firman, William D. "The Relationship of Cost to Quality in Education." *Long-Range Planning in School Finance.* Proceedings of the Sixth National School Finance Conference, Sponsored by the Committee on Educational Finance. Washington, D. C.: National Education Association, 1963. p. 101-10.

Project TALENT conducted by the University of Pittsburgh and the American Institutes for Research under the direction of John C. Flanagan could not be construed as a study of school finance by any stretch of the imagination, but it has come up with findings which hold important implications for students of school finance.[16]

Project TALENT has found that achievement levels in schools are related to certain measures of fiscal input. Among these are (a) average teacher's salary; (b) teacher's experience; (c) the size of the library; and (d) the per-pupil expenditure. Beyond this, TALENT has accumulated an extensive data bank of pupil output measures which should be a boon to school finance researchers.

J. Alan Thomas, in an independent study using Project TALENT data, analyzed the relationships between selected inputs and mean test scores. Inputs included resources and home and community conditions. Using multiple regression techniques, he found that inputs of this nature do affect mean test scores.[17]

It was previously noted that the studies at the Institute of Administrative Research, Columbia University, generally assumed the cost-quality relationships to be linear with no discernible point of diminishing returns. While this writer was an Associate with the Institute, he re-examined many of these relationships by using a national sample of schools instead of the previous sample of metropolitan New York City schools. Unlike earlier studies, several of the relationships between fiscal input measures and output were found to be nonlinear.[18] This study suggested the need for research to determine optimum allocations of school district financial resources. Evidence was found that these allocations might vary as the degree of financial constraint varied.

In the national sample it was discovered (as in previous studies) that school district salaries were positively related to favorable teacher characteristics which, in turn, were related to the process quality criterion. Also (as in previous studies) the number of teachers employed per 1,000 pupil units had a positive relationship with the criterion. For districts with limited resources, these two positive conditions competed with one another for available resources. Raising salary levels in such districts increased their potential for attracting better teachers which, in

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[16] Flanagan, John C., and others. *A Survey and Follow-up Study of Educational Plans and Decisions in Relation to Attitude Patterns: Studies of the American High School.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 226. Pittsburgh: University of Pittsburgh, 1962.

[17] Thomas, J. Alan. *Efficiency in Education: A Study of the Relationship Between Selected Inputs and Mean Test Scores in a Sample of Senior High Schools.* Doctoral Dissertation. Stanford, Calif.: Stanford University, 1962.

[18] Swanson, Austin D. *Effective Administrative Strategy.* New York: Institute of Administrative Research, Teachers College, Columbia University, 1961. 80 p.

TABLE 1.—THE INFLUENCE UPON SCHOOL EFFECTIVENESS OF ALTERNATIVES CONCERNING SALARY LEVELS AND STAFFING RATIO

Necessary resources	Salary level	Staffing adequacy	Personnel cost	School effectiveness
1	2	3	4	5
Unlimited	High	High	High	High
Limited	High	Low	Moderate	High moderate
Limited	Moderate	Moderate	Moderate	Moderate
Limited	Low	High	Moderate	Low moderate
Inadequate	Low	Low	Low	Low

turn, increased their quality potential. But it also necessitated the reduction of the number of persons employed which, in turn, reduced their quality potential. Increasing the number of persons employed increased the potential for quality, but it reduced the level of salaries which could be paid which, in turn, reduced the quality of persons employed. On this continuum of alternatives it would be desirable to find a point where optimum school quality is realized. Several continuum points are examined in Table 1 along with their effect upon the output measure as observed in the study. This analysis showed that salary considerations take priority over staffing adequacy, given the constraint of moderate resources. However, the technique of analysis did not permit the identification of the point of balance between salary level and staffing adequacy which would maximize the quality of the output.

Systematic investigation for the purpose of maximizing the return from school financial input has long been handicapped by the difficulty of quantifying the myriad of variables involved, and by an unwillingness to take full advantage of those measures which are available. Substantial progress has been made in recent years in quantifying variables. Even though precise measures of educational benefit may never be realized, it is important to assess the effects of school appropriations as carefully as possible with the measures available.

New Directions in Cost-Quality Research

A series of studies has been undertaken at the State University of New York at Buffalo whose purpose is to estimate the optimum allocation of financial input into schools on assumptions of varying degrees of financial constraint. These studies propose to accomplish the task by first analyzing the relationships between components of financial input to schools, interaction variables, and a measure of output, school-affected pupil achievement, thereby establishing an empirical base for the generation of mathematical models of the allocation of financial resources. These models will be subjected to optimization techniques on the assumption of varying degrees of financial constraint. The results can serve as new guides for allocating school financial resources that are not based upon the implied assumption in most existing guides of unlimited resources.

The models of financial allocations will be developed by multiple regression analysis techniques by using school-affected pupil achievement as the dependent variable, and expenditures per unit for various categories of educational service as the independent variables. The measure of school-affected achievement will be the school district median residual value, where a residual is computed for each pupil by subtracting from his actual achievement score on a standardized test the achievement score predicted from his socioeconomic rating. The independent variables will consist of components of the total discretionary expenditures per pupil for each school district in the sample.

Three samples are being used in the study. One is the previously cited structured sample of the school districts in New York State which participated in the Quality Measurement Project. The second and third samples are drawn from school districts participating in Project TALENT, previously cited.

The results of this study should have great significance for future fiscal planning of school districts in the following ways: (a) For the first time, empirically based guides for the allocation of school financial resources that are not founded on the assumption of unlimited school district financial resources will be provided. (b) Allocation decisions, presently made largely by subjective judgment, could be made more rationally. Application of these findings should result in greater efficiency in school systems in their use of financial resources.

The optimization study makes certain assumptions: (a) Over-all school quality or effectiveness can be quantified. (b) At least some expenditures per unit are correlated with school effectiveness. (c) Categories of school expenditures can be varied independently. (d) There is some wisdom in present public-school practice. The major weaknesses of this approach are the limitations of variable measurement and the assumption that there is a degree of wisdom in present operational arrangements. This approach should provide a means for developing more efficient operations within the existing educational structure. To substantially modify this structure, new arrangements that require other analytical techniques, such as program cost-analysis and cost-benefit analysis, need to be explored.

In education we have tended to look at the entire operation, not concerning ourselves with the parts, but rather the sum of the parts. Program budgeting will give us precise financial information on the cost of components of the total educational process. This, coupled with measures of pupil growth, will facilitate making cost-quality comparisons between parallel programs, new and old. The general procedure was discussed above under Application A of the general input-output model.

School districts are beginning to experiment with new programs that involve nongrading, teams of teachers, imaginative use of paraprofessionals and of student teachers, flexible space utilization, programmed instruction, educational television, and the like. There has been some evaluation of the educational effects of these programs, but little evaluation, which considers cost as well as educational effect, has taken place. Such studies need to be made before a convincing case can be built for abandoning the old and tried for the new and unknown.

Because of the difficulties in quantifying the output of education, perhaps another analytical technique that does not demand such quantification should be tried. This would be cost-benefit analysis which has been found to be very useful by the Defense Department in developing military strategy. Like the procedures above, cost-benefit analysis assists in evaluating the implications of alternative courses of action, but unlike the procedures above, it is concerned with the selection among *prospective* systems, not existing systems. In most respects the procedures in cost-benefit analysis are similar to those described in the optimization analysis. The principal difference lies in the assignment of equation parameters. In the optimization analysis these are generated empirically from data gathered from existing systems. In cost-benefit analysis the parameters must be estimated because the systems being evaluated do not in fact exist.

There are several directions in which we may go in order to sharpen our knowledge of cost-quality relationships. For the present, at least, all possible analytical techniques should be used. Some may be found to be inappropriate in the educational context; others will prove to be quite appropriate. The challenge of educational cost-quality analysis lies before us, particularly in the interaction function. It is time to open the black box.

The Project to Revise Handbook II: Financial Accounting for Local and State School Systems

Allan R. Lichtenberger

Financial Accounting for Local and State School Systems, Handbook II, defined items and terms that hundreds of people agreed upon as being important enough to be maintained in comparable form in the school finance records of all school systems in the United States. The manual is part of a series of cooperatively developed handbooks of standardized records and reports terminology: Handbook I, for state use, is a reporting manual; Handbook III deals with property information; Handbook IV, with staff records; Handbook V, with pupil data; and Handbook VI, in process of development, with curriculum.

At least 100,000 copies of Handbook II, now 10 years old, have been distributed. It is still in heavy demand. The manual must be given credit for bringing into order the language of school finance accounting, and for achieving a degree of comparability of school finance information which had been sought for 50 years. It has served well.

A glimpse of the nature of the revised Handbook II may be found in the demands for the revision. Obviously, a great many new items and terms have come into use in school finance accounting during the past decade. The need for agreement on these terms and their definitions is urgent. This in itself is a task of considerable magnitude.

School finance people have voiced the need for a chart of standardized object accounts and a refined chart of function accounts. However, when Handbook II was developed, few were regarding these two charts of accounts as separate. As a result, the manual presented them in combined form. This has created problems. Clearly, the revised handbook must solve this problem.

Before 1957, educational accounting was regarded as synonymous with finance accounting. Gradually, we have come to recognize that educational accounting means not only finance accounting, but pupil accounting, staff accounting, property accounting, and curriculum or activities accounting as well. There are not five isolated accounting systems, but one comprehen-

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sive system of educational information. The revised Handbook II, therefore, must facilitate interrelating both items of finance information and items of educational information.

A review of the present Handbook II makes evident that the purpose of its development and use was comparability of statistics, which is based on standardized items and terms in the processes of operating school systems. This need for well-defined items and terms requires standardization to take management processes in education into account, and that presents an enormous area of study.

In terms of things to manage, questions to be asked, questions to be answered, and decisions to be made, school system management is growing and changing at an impressive rate. Rationalization of meanings of terms is not possible in compressed-time situations. Decentralization of management is no longer a matter of choice; it is a necessity. However, it cannot be successful without definition of terms. In similar manner, outputs of systems of information serve as inputs for other systems of information. Without standardization of terms, this process is impossible. Furthermore, a lack of standardization results in enormous costs. Even more serious, it limits technological processes since we are virtually dependent on coding.

Standardization of terminology as it relates to a comprehensive intelligence system is only a foundation for the superstructure of management in education. We are well into a time when the operation of school systems must be broken into manageable components or pieces associated with identified objectives—components in which the fiscal and other information cycles can operate in a controlled manner. For want of a better term, these components or pieces are being called programs.

The concept of programs as they are becoming recognized is not new, of course, but budgeting and accounting for them as separate entities have not been common practice. Budgeting for school system operation, as suggested in Handbook II, is in broad receipt-and-expense categories encompassing the entire enterprise. In reality the process is not budgeting at all. It is a presentation of appropriation categories in which the emphasis is on *not overspending the estimates* rather than on relating the achievement of objectives to the dollars spent. For decision-making purposes, the information they yield has limited value.

Following the counsel of representatives of several national educational organizations, staff members of the Handbook Program in the U. S. Office of Education are exploring research and practice in program planning, budgeting, and accounting in school systems. With the number of school systems experimenting with different kinds of budgeting and accounting increasing, a revised Handbook II becomes imperative.

A program comprises the elements involved in the achievement of what is believed to be worth accomplishing. For example, the objective of raising the level of reading ability of children who do not read well would consist of the following: One important step would be to create a "file" of information about each child. Another step would be to map out a schedule of the activities believed essential to improving their reading ability—the curriculum file. Then, there must be the assignment of people to perform the activities—teachers, teacher aides, librarians, and others. This calls for a staff file. Pupils and staff members need spaces in which to work toward the objective. A facilities file is essential. And there must be equipment, materials, supplies, "things" to be used by staff and pupils. A file for these things must be at hand.

Now, in this backing up from the objective, a process of program planning has been employed. When the salaries of staff members and the costs of "things" are allocated to the plan, at least part of the finance file is established. This is program budgeting. The program can go into operation. As it operates, it is traced through record keeping. This is program accounting. When the scheduled time runs out, the cost of *what was done* is known. This is cost accounting.

By applying the best measures available, there can be an assessment of how well the objective was achieved. Whatever the gain in level of reading ability, it is the "value added" or the benefit. The cost in dollars associated with the benefit is the cost-benefit. To the school administrator, there is a world of difference between the cost of reading instruction and the cost of raising the reading level of certain pupils a certain amount.

The program has gone through a cycle. Through feedback from the experience of that cycle there can be a "closing of the loop" to re-planning, re-budgeting, re-operating, re-accounting, and re-evaluation. A body of important knowledge is built in this manner. It is a way of relating achievement to dollars spent.

At the present time there is emerging the practice of establishing cost centers that are closely associated with programs. They seem to be a budget and accounting device in which the fiscal cycle can operate as if the program or programs they represent are the only ones the school system offers.

While there is not enough experience to establish generalizations, it is logical that for every cost center there should be someone closely associated with the programs who is in position to make judgments, to evaluate, and to have a hand in the feedback to re-planning and re-budgeting. Simply to know what the costs of clusters of activities are without organizational arrangements that permit decision making to the point of making a difference is not program planning, budgeting, and accounting. Capable finance accountants can report costs of almost any segment of school operation, but much of the work of computing such costs is of little value unless management is geared to bring impact of decision-making on those segments.

The first revision of Handbook II should probably be followed quickly by a second revision, for the advances in finance accounting in education are likely to be fairly rapid. Economists are becoming increasingly interested in education, suggesting, for example, that as much as one-third of the national economic growth is attributable to education. There is a growing acceptance and understanding of educational costs as investments—investments in human capital—from which a return can be expected. This is in contrast to the attitude that educational costs are an *expense*. This is, of course, a pleasant prospect, but it suggests, too, that when money is spent for education, there should be an expectation of where, how, and when its impact is likely to be felt. In other words, some type of planning, budgeting, accounting, and evaluating that relates dollars spent to the achievement of objectives will be necessary.

In attempts to justify a concern about moving toward practices of program planning, budgeting, and accounting in education, the words of Peter Drucker [1] are worth considering. Drucker said that for management to do five years later what it would have been smart to have done five years earlier is a recipe for frustration and failure.

A great many school administrators believe it is wise to begin to promote processes of program planning, budgeting, and accounting *now,* but to do it sensibly through a phasing-out and phasing-in method to avoid a needless disruption of the going business of education. The intuitive judgments of the nontheoretical school administrator have served this nation well, and in moving toward modern management practices there is likely to be the discovery that many so-called traditional administrative methods ought to be retained.

In retrospect it is not difficult to see that strategic planning for education, from the national level to the local level, has not been notably strong. This may be the single, most important reason that education is one of the last enterprises to move into program planning, budgeting, and accounting. Strategic planning is in the area of big policy making; it is the kind of planning in which the need for types of programs is identified before the need develops into a problem. It is planning in the gross, has long-time horizons, and provides all-important lead time for planning and preparation. Seldom has this lead time been available. Far more common has been the practice of establishing programs on a "crash" basis. Usually, what is done in "crash" programs is what would have been smart to do earlier.

Handbook II, revised, may simply present criteria to serve in program and cost-center identification. This would leave to schools and school systems the identification of objectives and the clusters of activities bearing on them that responsible school people believe are important enough to be planned for, budgeted for, and accounted for. In the doing, surely, there will be enough questions raised that more attention will be given to strategic planning.

Whatever the new Handbook II will present, it will be as useful and as effective as several hundred selected people who know about educational accounting and management will insist that it be.

The planning committee for the Handbook II Revision Project represents a fairly broad range of educational interests and competencies. Its membership, in addition, includes persons who are representative of specialties and disciplines relating to education. There seems to be firm agreement within the membership that first steps in establishing program categories should be in terms of goals foreseen by as much as 10 years. Not only is this commendably cautious, but it mandates the kinds of thinking and study which call for judgments regarding directions education may take. Thinking and study are occurring to the point of raising important questions. For example, in a recent conference on program budgeting, some questions were:

1. Should budget categories emphasize *process* or expected *product?*
2. What kinds of budget classifications suggest achievement in terms of need?
3. Should administrative relevance be given greater emphasis in budget categories than it has in the past?

Answers to questions such as these are more likely to come from experienced and concerned school administrators than from any other group. There is fairly clear indication that numbers of school systems are exercising considerable initiative in establishing budgeting and accounting categories around identified needs and expected accomplishments or achievement. In most instances, however, this is in the form of in-house documents which go beyond traditional, official budgeting and reporting. This suggests that greater visibility may reveal some examples of excellent program planning, budgeting, and accounting in terms of educational objectives.

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[1] Drucker, Peter F. "How the Effective Executive Does It." *Fortune* 75:140-43; February 1967.

At the present time, the project to revise Handbook II has a major task in attempting to identify those workable categories, items, and definitions that offer promise as instruments or means of communicating educational values. It is a project having elements of excitement, for from its beginning those who are associated with the effort have sensed a growing change in educational management. It is a change from a traditional defensive type of administration to one of aggressiveness. The new handbook is not likely to be a product of passive effort.

Comments on Programming-Planning-Budgeting

A Report on a Pilot Demonstration of PPB

Selma J. Mushkin

THE STATE-LOCAL Finances Project of The George Washington University is now undertaking an intergovernmental pilot demonstration of planning-programming-budgeting systems in city, county, and state governments. This project, known as 5-5-5, will involve five states, five counties, and five cities in working toward developing PPB systems appropriate to the special problems of their own jurisdictions, and toward redefining intergovernmental fiscal relations in a PPB framework.

The main thrust of this demonstration project, which will extend over a one-year period, is to build capability and evaluate the feasibility and desirability of PPB systems in nonfederal government jurisdictions.

President Johnson directed all major nondefense federal agencies to adopt PPB systems, an innovative approach that had been initiated earlier in the Department of Defense. This national government policy has heightened interest among state and local government officials in seeking more scientific tools for their public decision-making.

The staff of the State-Local Finances Project is providing technical advice to the 15 governmental jurisdictions, and coordinating the exchange of experiences among them. A series of notes and reports exploring the various aspects of PPB has been widely distrib-

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uted to staff and elected officials at the state and local levels. The long-run objectives of the project are to strengthen the managing and planning for public services in an intergovernmental pattern. More effective and efficient government is the purpose.

An advisory board gives general policy direction to the project. Representatives of six national governmental organizations serve on the board. These groups are the Council of State Governments, the International City Managers Association, the National Association of Counties, the National Governor's Conference, the National League of Cities, and the United States Conference of Mayors.

Through active participation of these representatives of the units of government, research materials prepared by the project are channeled directly to the decision-makers at the state, county, and local levels of government.

Comments on Revision of Handbook II

Henry M. Levin

I HAVE BEEN PRIVILEGED to participate in planning the revision of Handbook II. At the beginning of the planning stage, the inclusion of economists and later of political scientists, sociologists, and psychologists was an innovative gesture. There were some questions as to whether an interdisciplinary team could effectively plan a volume which would set forth the types of data that members of each discipline needed for their research. Fortunately we learned that the expected conflicts among members of the various professions failed to develop. In fact, the major differences appeared to be ones of semantics. All of us were interested in the same data, but we used different names to describe them, and we had different applications for which they would be useful. The school administrators wanted more information for the purpose of managing their schools, while researchers desired better data for the purpose of increasing their knowledge of educational processes. Moreover, the accountants and data processing representatives agreed that the changes in data collection which we desired were feasible.

I am a research economist, but I am not as far from the action in the field of education as one might surmise from my occupational title. I am presently engaged in a study which seeks to determine how educational resources are transformed into educational outcomes. Accordingly, I am in continual contact with representatives of the U.S. Office of Education and the National Education Association, as well as teachers and school administrators; and I am conversant with most of the latest educational research. Moreover, I am cognizant of the many obstacles that must be overcome in order to collect the information that we desire. Yet the total information system that we envision will serve a multiplicity of needs.

A part of the change that we see here, including the implementation of program budgeting, is the evaluation of costs not in terms of the cost of ad-

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ministration or instruction—categories which most of us agree do not have very much meaning in terms of performance—but rather in terms of the tasks that we want our schools to perform and the costs of the various alternatives for achieving these ends.

I would like to give two examples of why an extensive revision of Handbook II is necessary, if our cost information is to be made useful for decision-making. These two examples are meant to be illustrative rather than exhaustive.

In many ways our present system of school accounts distorts the true costs of schooling in a given fiscal year. Our budgets currently do not treat capital replacement and renovation as capital items. Why? Because school districts must finance these expenditures out of current revenues. Yet, if a business firm were to buy a piece of equipment that would last 10 or 15 years, it would call it a capital good. It would not pay for it within one accounting period. Rather, it would set aside reserves over a 15-year period to buy a new machine. (At the present time there are legal restrictions which prevent school districts from setting aside reserves.) The business firm realizes that this particular machine is not consumed within one accounting period, and, therefore, when it costs out the flow of services from such capital equipment in order to measure the costs of production, it uses only the depreciated part of the machinery, that part that has been figuratively used up in one accounting period. On the other hand, when we replace a school's boiler or install a new roof on a school building, our school accounts attribute the entire amount of the improvements to the students who are attending school in that year. We are charging off in one year a replacement that will serve students for several decades (e.g., 30 years), when we ought to impute only 1/30 of that cost to any particular year. From a conceptual point of view, what we are really concerned with is the cost of those inputs that service a student within a given accounting period. This is the real cost of providing output in that year.

By charging off capital items—items that last more than one accounting period—in a single accounting period within our school budgets, we overstate the costs for that particular year. Conversely, we understate the related costs for subsequent years. The result is a distortion of the *real* annual costs per unit of output. Conceptually, we should try to convert capital goods, equipment, and instructional aids into flows of services for costing purposes, in order to derive realistically the costs of a given program. This is standard accounting procedure in the private sector, and it should be adopted by school districts for informational purposes no matter how capital improvements are financed.

Another way in which a total information approach to school accounting might be helpful is in the evaluation of new educational technology.

In his latest book,[1] Dr. Conant castigates school management for its recalcitrance in adopting new technology for the schools. For example, he says that only a small proportion of the high schools that he surveyed had ETV. I would suggest that in this case the school management people know more about the principles of economics than Dr. Conant appears to know. Just because new technology exists does not mean that to adopt it is a good decision.

It is surprising that Conant does not make the same criticism of other industries. For example, the techniques for producing electrical power with nuclear energy have been with us for a long time; therefore, why are we obtaining most of our electricity from non-nuclear fuels? The answer is a simple one. Nuclear power has represented a very costly device for producing electricity. It has been much more efficient to produce electricity with oil, coal, and natural gas in most geographic areas. This is obviously changing as nuclear technology becomes less expensive, but it is important to note that the new technology should not be adopted merely because it is revolutionary. Its cost is an important consideration.

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[1] Conant, James B. *The Comprehensive High School.* New York: McGraw-Hill Book Co., 1967. p. 70.

The point is that we are concerned with the most effective allocation of resources. Something new and gleaming may be a good status symbol, but it might not be of practical use if the old technology is more effective per dollar of expenditure.

Now let us apply this reasoning to some of the new educational technologies. Conant is probably appalled that the so-called teaching machines or computerized instructional systems have existed for some time and yet have not been widely adopted. Experiments in computerized instruction have been supported by the U. S. Office of Education, and several generations of "software" have been written for these machines; but no school district has suddenly said, "This is great, this new technology, we're going to buy it!" Why? To get a given increase in student performance levels on certain sets of basic skills would cost an estimated three or four times as much as it would to increase student performance the same amount using the "outmoded technology." Who is making the bad decision here? Is it the school administrator who buys the new technology as presently constituted or the one who keeps the outmoded technology? Would the administrator who knew that the new technology would cost four times as much to get the same output be wise in buying it? Is it a good decision to invest in expensive hardware whose only proven quality at the present time is its ability to become obsolete almost from the moment of its manufacture? I leave the answers to these questions to those critics who suggest that school administrators are improvident because of their slow rate of adoption of the new technology.

Educational television represents another fine example. This not-so-new technology existed well over a decade ago, and glowing reports came from Hagerstown where the first large-scale use of this innovation was established. We were told, and we are still told, how successful the Hagerstown ETV system is, although we are never told what criteria of success are being imposed; and we know that it has replaced much of the instruction of classroom teachers. The point is that Hagerstown did, indeed, get a wonderful bargain; it received a very expensive instructional aid for no money down and no monthly payments. Now Hagerstown no longer receives the support of the U.S. Office of Education, and it is paying the operating costs of the system out of its own funds, an amount which, I understand, is about $46,000 a year. This expenditure is mainly attributable to the costs of maintaining transmission lines between the center where the programs are produced and the schools where the programs are delivered on ETV. But the basic installation, the initial operating costs, and other technical services were subsidized by the Office of Education, not the Hagerstown taxpayers.

What has the Hagerstown experiment taught us? It has taught us that if you can get a free instructional aid, by all means adopt it, but since the Office of Education does not seem ready to install free ETV in every school district, this lesson is a trivial one. In the real world, teaching resources are not costless; and the school administrator must face the complex task of allocating his budget to school inputs in such a way that he maximizes the educational product of his school or school district, subject to a given budget constraint. The relative effectiveness of ETV as compared to the conventional classroom setting has not been established. If Conant possesses information which shows that ETV does have an advantage over conventional teaching techniques, *once the relative costs are considered*, he would do us a great service by presenting it. But until such evidence is presented, his criticism of school administrators for their caution in adopting ETV and other new techniques lacks substance.

Yet we know that the new technology is the coming thing, and I am not underestimating its potential impact. Ways will be found to reduce costs. We shall eventually reach a point, perhaps the sixth generation of hardware, when a computerized educational system will not be threatened with quick obsolescence. Moreover, the programs written for these machines, the software, will become more sophisticated and generalized so that they, too, will not be rapidly superseded.

But how can a school administrator evaluate whether the cost-effectiveness of the new technology will equal or surpass that of the old? It is a very expensive and highly uncertain process to run his own "controlled" experiments. On the other hand, a total information system will enable us to derive some fairly consistent measures of performance and costs for a wide variety of technologies distributed across many school districts. Using this information, interdisciplinary teams of researchers can measure the costs of a variety of alternatives for increasing performance levels of students (e.g., in basic skills). The school administrator will provide cost and performance data for his system, and he will receive in return information on the costs and effectiveness of many alternatives. Of course, the data that are collected will be confidential so that the identity of any cooperating school or school district will not be disclosed. (This procedure is similar to that of the U.S. Bureau of the Census.) In turn, the school decision-maker will use this information to determine whether a given technology or technique is a feasible alternative to his present way of doing things, after considering the unique characteristics of his own school system.

As a researcher, I welcome the revision of Handbook II and the data revolution which it will inspire. For, in addition to the direct impact that it will have on school decision-making through program budgeting, the subsequent analysis of this information by members of various professions will feed back information and analyses useful to administrators for increasing the effectiveness of their schools.

Dimensions of the School Budget

Erick L. Lindman

STATE LEGISLATURES and the U. S. Congress need information to evaluate the effectiveness of various grant-in-aid programs. In this respect, program accounting for public schools differs fundamentally from program planning and budgeting systems applicable to federal departments. The intergovernmental aspect of public-school finance as well as the inherent difficulty of evaluating educational "output" make the public-school problem uniquely difficult.

To avoid confusion in approaching this problem, it is necessary to distinguish clearly among three closely related activities involving the analysis of school costs.

First, there is the annual planning and evaluation procedure. To provide the local board of education with evidence relative to program choices and to clarify budgetary options, better procedures are needed to relate program effectiveness to program costs. In most cases, this can be achieved by developing a responsibility-oriented planning procedure in which identifiable programs are assigned to specific members of the administrative staff so that a single individual is responsible for preparing cost estimates and presenting evidence relating to the effectiveness of each program. Such a responsibility-oriented planning procedure can be tailored to fit local conditions and needs. There is no need for uniformity of procedures among different school districts.

The second cost analysis activity, standardized program accounting, has a different purpose from the local program planning and review procedure. While the assignment of responsibilities for program planning and evaluation purposes among selected members of the administrative staff should reflect local conditions and special talents of individuals, standardized accounting procedures are intended to produce uniformity among school systems. Such uniformity of accounting procedures is needed to facilitate comparison of the costs of school programs in different cities and to provide valid information concerning their costs for state legislatures and for the U. S. Congress.

Much work has been done to standardize the present functional account classifications used in public schools. In addition, classification of expenditures by school level, such as elementary schools or high schools, is standardized throughout the nation. But classification of school expenditures for such programs as special education, compensatory education, or vocational education have not been standardized; yet, these are the very programs for which state legislatures and the Congress have appropriated categorical aid funds and for which valid cost information is needed by the legislature and the Congress. For this reason, a next step in improving school accounting and budgeting procedures should be to develop standardized program accounting in order to identify the cost of such aided programs uniformly throughout the nation.

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A third type of study involving the analysis of school costs relates to long-term planning. Occasionally, special studies are needed to provide evidence to help the school board make decisions about long-term plans. Frequently, these studies are elaborate and expensive and should not be part of the annual budget procedure. They should, instead, be made occasionally as needed. In this category studies of the cost per pupil of teaching of various school subjects should be included.

It is apparent that of the three aspects of public-school cost analysis, the development of standardized program accounting requires common agreement among local school districts and among the 50 states. For this purpose, it is useful to identify the various kinds of dimensions that can be used to classify school expenditures. The following list of six dimensions indicates the variety of ways in which school expenditures can be classified:

1. *Type of school classification* (first dimension)—refers to the classification of public-school expenditures into such categories as elementary schools, secondary schools, summer schools, adult or evening schools.

2. *Functional classification* (second dimension)—refers to the standard classification of public-school expenditures into such categories as administration, instruction, plant operation.

3. *Restricted income classification* (third dimension)—refers to the classification of public-school expenditures into categories for which earmarked or restricted income is available, such as vocational education, compensatory education, special education.

4. *Curriculum classification* (fourth dimension)—refers to classification of public-school expenditures into such categories as arithmetic, foreign language, geography.

5. *Instructional method classification* (fifth dimension)—refers to the classification of public-school expenditures into such categories as libraries, instructional television.

6. *Social purpose classification* (sixth dimension)—refers to the classification of school expenditures into such categories as the development of worthy home membership, ethical character, vocational competence, appreciation of the arts, civic responsibility.

Of course, it will be noted that the first and second of these dimensions are in current use and have been standardized. The question that must be answered now is: Which of the other dimensions, if any, are of sufficient importance to be standardized and used uniformly by all school systems throughout the United States? Of the various possibilities, the third dimension seems to be most in need of standardization in order to supply information for state legislatures and the U. S. Congress about the categorical aid programs in which they are interested. Since this information is needed annually and since it will be used to compare program costs in different school systems, a standard classification system is needed.

The Impact of Professional Negotiation on the School Budget

Erwin L. Coons

IT HAS BEEN PRESUMED that professional negotiation will have an impact on the school budget. In order to alter the course of expenditures substantially, we assume a concurrent change in school revenues. It is further presumed that written agreements, originating from mandate of state statute and from voluntary action by local boards of education, are designed to provide teachers an effective voice in decision-making on money matters. But there are variable and unknown factors.

The superintendent's role in the cooperative process of negotiation is a factor that cannot be appraised accurately. His influence will continue to be a variable; however, his value judgments, under a negotiation agreement, are to be weighed much more critically than under former arrangements. The new system of checks and balances of professional negotiation is itself an unknown. Furthermore, we have yet to determine how effective teachers associations will be in bringing the teachers' views on spending policies to the negotiation table, for negotiation rights for teachers do not necessarily mean a fair hearing or equal weight for their professional advice. Therefore, the extent, but not the intent, of teacher studies and recommendation on financial policies is also an unknown.

Teacher negotiations must be concerned with appropriate balance, legitimate priorities, and justifiable economies in spending policies as they affect the district's ability to achieve its educational objectives. Superintendents have established an influential role in the formation of budgetary policies, but it would be a serious error to assume that a negotiation agreement always results in diminishing his influence. In fact, the exact opposite has happened. On the other hand, reports from districts experienced with negotiations indicate that the process does bring change both in the amount and in the method of allocation of school funds as well as in the speed with which available funds are discovered and applied.

As I read the signs, they say that teacher negotiations are

1. *Productive* in terms of benefits and understandings.

2. *Vital* in breaking the financial strangle hold which has choked public education.

3. *Catalytic* in getting teachers to assume their full professional responsibility.

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4. *Therapeutic* in getting all participants to see the opportunities and challenges of their new roles.
5. *Stimulative* in moving state legislatures to a positive posture with regard to their responsibility for public education.
6. But *traumatic* to the superintendent who sees no need for sharing his negotiating role.

The perplexing questions are direction and character. The shape of things to come is not clear and will probably change form many times. State and local teachers associations, as well as the NEA and the AASA, favor broad-based negotiation. Teachers insist that their concerns go far beyond self-interest. They propose that professional negotiation consider the public interest, including the welfare of the pupils and the school system.

Let us not find fault with this wide-angled scope; it is an earmark of professional negotiation, setting it apart from collective bargaining. The teachers of Wisconsin, Michigan, and Massachusetts now have collective bargaining rights under labor laws. Because of legal restrictions and precedents established by court decisions, they will negotiate primarily for teacher welfare benefits. In fact, a report on teacher negotiations published by the American Bar Association (August 8, 1966) indicates a heavy concentration on salaries and fringe benefits in all types of teacher negotiations.

Considering the sharp competition for college graduates, it is hardly a phenomenon that efforts to improve teacher welfare benefits should come first in the problem areas where schools are most vulnerable. More will have to be done to offset the advantage in salary and nonsalary benefits enjoyed by government, business, and industry. Nevertheless, teachers will not be satisfied with bread alone, for they are even more concerned about conditions which make it possible for them to render a professional service.

Until more research evidence is available, until some of the "sticky" issues of teacher negotiations are resolved, and until the extension of state legislation takes a pattern, prediction will be hazardous. Yet, we can say with some certainty that the impact on school budgets will depend on such factors as

1. The scope of teacher negotiations
2. The availability of funds
3. The effectiveness of professional sanctions
4. The readiness of local teachers associations to assume the responsibilities of negotiation
5. The sophistication of teacher representatives, especially in matters of school finance.

As we analyze the probable character and force of the impact, we should consider the effect on

1. School revenues
2. Total current expenditures
3. Percentage allocations to various items of current expenditure
4. Financing capital outlays
5. Debt service
6. Balances and reserves
7. Application of funds from the federal government.

An examination of hundreds of negotiation agreements reveals that certain subjects are frequently listed as appropriate items for negotiation: grievance procedures, promotion policies, curriculum studies, and textbook selection. Since they deal with process more than substance, they are not cost items. However, let us consider the "wave" effect of certain negotiated benefits. For example, a 10-percent adjustment in teachers' salaries may require similar adjustments in salaries of supervisory and administrative personnel which, in turn, brings other salary revisions. Contributions to retirement systems and OASI taxes are immediately increased. Thus, the initial impact on *instruction* results in an upward movement in *administration, fixed charges,* and possibly in maintenance. The full impact will show best in total current expenditures.

Is the increase a normal adjustment to a larger school enrollment? Have district expenditures been influenced by negotiation, or would the same adjustments have been made through unilateral decision-making? This is the difficult question we seek to answer.

The negotiation process will cause school boards to make far greater use of consultative assistance than ever before. In most cases, this advice will be sought as an aid to reaching agreement. However, if impasse develops, the advisory assistance of a conciliator or of a mediation panel will be an expenditure item for the district and, therefore, an increase in expenditures for administration.

Negotiation teams representing teachers will certainly press for payroll deduction to cover association dues, group insurance premiums, tax-sheltered annuities, and hospitalization. Depending on how far the district has already moved in this direction, payroll deduction will increase expenditures for administration.

Negotiation pressures for salary increases and improvements in the structuring of salary schedules for teachers will create a gradual upward movement in the monies allocated for the additional time.

Teacher negotiators are already protesting the financing of school construction that consumes revenues that might otherwise be allocated to *instruction*. This device avoids bond issues. Although this method is frugal, it ignores the reaction it provokes when higher tax rates are proposed for operation. For this reason, teacher negotiations will inevitably fight this method of financing site purchases, building additions, and other major capital outlays as a means for reducing expenditures for *debt service*.

Another means for accomplishing the same end, which will also be watched by teacher representatives, is estimating budget needs in certain categories with a predictable transfer to capital outlay or to a reserve fund before the close of the fiscal year. The "padded" budget, the superabundant or growing balance, the earmarked reserve of perennial character, and the investment club—all are in for a good "going-over" as teacher negotiations press for ways to pump more money into expenditures for instruction. I foresee tight budgets, lower balances, decreased reserves, and currently more short-term borrowing. Expenditures for capital outlay may become more limited in scope as well as in amount with greater reliance on bond issues.

This forecast may mislead you to believe that percentage allocations to items of current expenditure may change radically with the advent of teacher negotiations. Only where budget analysis reveals unjustifiable overemphasis or obvious neglect will this be true. A general prediction is that where allocations are in appropriate array, increased expenditures will be so spread among the categories that little change in emphasis will appear.

To substantiate this conclusion, we have a case study of a district's budget before and after negotiations were introduced. Negotiations produced a package with a price tag of approximately $ 1.5 million.

TABLE 1.—TEACHER NEGOTIATIONS AND THEIR IMPACT ON PERCENTAGE ALLOCATIONS IN A SCHOOL BUDGET*

Budget category	1965-66, actual		1966-67, budget		1967-68, budget	
	Amount	Percent	Amount	Percent	Amount	Percent
1	2	3	4	5	6	7
Administration	$ 251,485	2.9%	$ 391,096	4.0%	$ 423,401	3.8%
Instruction	6,429,136	75.4	7,322,448	74.8	8,373,212	75.2
(Teachers' salaries)	(5,848,335)	(68.6)	(5,815,723)	(59.4)	(6,554,026)	(58.8)
Operation	692,013	8.1	733,697	7.5	783,296	7.0
Maintenance	248,276	2.9	342,177	3.5	387,413	3.5
Fixed charges	508,167	6.0	610,086	6.2	709,235	6.4
Auxiliary services	128,152	1.5	134,548	1.4	169,637	1.5
Transportation	271,149	3.2	261,589	2.7	291,901	2.6
Total current expenditures	$8,528,378	100.0%	$9,795,641	100.1%	$11,138,095	100.0%
Capital outlay	79,581	9.3	83,817	8.6	145,180	13.0
Debt service	(None—a fiscally dependent district)					
Total	$8,607,959	109.3%	$9,879,458	108.7%	$11,283,275	113.0%

*This district started teacher negotiations in 1966-67 under a state statute.

Case Study

Though teachers' salaries as a percent of current expenditures dropped in 1966-67, negotiated increases of $640,000 continued to place this item at 59 percent (Tables 1 and 2). An increase of $1 million in *instruction* raised this item only 4.0 percent. Contrary to my general prediction, capital outlays jumped from 8.6 percent to 13.0 percent of current expenditures. However, this district is fiscally dependent on the city government. Increases in administration resulted in a smaller percentage allocation and, as previously suggested, a "wave" effect on *fixed charges*. The new emphasis on *auxiliary services* illustrates the point that teacher negotiations can be professionally based.

In the same district, dollar amount increases and percents of increase are based on the amounts for the preceding year. Negotiation *did make an impact* on budget policies for 1967-68. Thus, the two trends that appeared in 1966-67 were reversed.

Evidence of Impact

At this point we can produce only scanty evidence to substantiate the presumption of an impact on the school budget as a direct result of teacher negotiations. First, we have no proof of what might have happened without it where we have an experience record for a few years. Second, a one-year gain is often affected by what did or did not happen in the preceding year. Third, comparing gains in any two districts ought to include some consideration of conditions before negotiations.

Impact on Revenues

Many solutions that negotiators will agree are desirable will have price tags. At the local level there is resistance to higher property taxes, sometimes justifiable. Assessment practices are still a blight which makes the property tax unproductive and unfair. Obsolete tax limitation imposed on local school districts by state legislatures places public education in a financial strait jacket in too many states. The school board that decides for a community, without attempting to sell the need, that it will not support a higher school tax rate is another obstacle. The school official who forever insists that referendums for operation must not compete with votes on school bonds is another problem which impinges on teacher negotiations. It is inevitable that negotiations will be drawn through this thorny brier patch that has blocked the way to adequate financing of public education. Negotiation should help to remove some, but not all, of this underbrush.

The federal government has already become a better partner in the financing of public elementary and secondary schools. Revenue receipts from federal funds in 1966-67 were 8 percent of total school revenue. As new and expanded projects bring more revenues to the local districts, where they may be applied for improvements in instruction as in Title I of the Education Act of 1965, they are appropriate subjects for negotiation. Although the intent of the Act clearly calls for teacher participation in deciding the local application, teachers have had little voice in formulating the projects. Major categories of the budget will not show the effect of this shift from unilateral decision-making to cooperative planning. However, subitems will bear only slight resemblance to what they might have been without negotiation.

A New Philosophy

Teacher negotiation marks the end of an inglorious period when teachers were expected to present their requests in terms of a cost figure dictated by the school board after all other expenditures had been estimated. Assigning the major budget item, teachers' salaries, to the "left-overs" is neither

TABLE 2.—INCREASES IN BUDGET ITEMS

Budget item	Before negotiation, 1965-66 to 1966-67		After negotiation, 1966-67 to 1967-68	
	Amount	Percent	Amount	Percent
1	2	3	4	5
Administration	$ 139,611	5.6%	$ 32,305	0.8%
Instruction	893,312	13.9	1,051,764	14.4
(Teachers' salaries)	(−32,612)	(−0.6)	(+738,303)	(12.7)
Operation	41,684	6.0	38,020	5.2
Maintenance	93,901	37.8	49,599	14.5
Fixed charges	101,919	20.0	99,149	16.3
Auxiliary services	6,396	5.0	35,089	26.1
Transportation	−9,560	−3.5	30,312	11.6
Total current expenditures	$1,267,263	14.9%	$1,342,453	13.0%
Capital outlay	4,236	5.3	61,363	75.0
Total expenditures	$1,271,499	14.8%	$1,650,523	16.0%

a new nor a sporadic practice. To teachers it was always the wall separating justice from expediency. I doubt that school budgets can be developed in this manner under an agreement for professional negotiation. Expenditure items that must be negotiated will be settled in the early stages of budget planning. Experienced negotiators will refuse to develop a program around a predetermined price tag. Instead, development of a budget around what must be provided to finance negotiated programs may become a reality. In fact, we already see concrete evidence of this reversal of priorities in many districts now engaged in teacher negotiations.

Another side effect, fringe benefit, or antiseptical cleansing is bound to come in those cases where negative thinking has permeated not only the school but also the community. Negotiation, when effectively practiced, rallies all forces to accomplish the possible which, in many cases, was considered impossible. Negotiation is a vehicle and must have fuel to continue its productive course. The search for that fuel brings us to the point where we began. It is not enough to have negotiation rights and skills of negotiation. Explosions, more violent than we are accustomed to hearing, will rock the schools unless more money is available to negotiate about. If teacher negotiation can blast through this barrier, it will deserve more praise and support than we now give it. I predict the blast, not the outcome.

To sum up. Teacher negotiation will have measurable effects:

1. Increase total current expenditures
2. Bring expenditures for teachers' salaries in line with current expenditures
3. Induce new priorities and new methods of setting those priorities in the budget-making process
4. Generate the pressure needed to secure more school revenue
5. End penny-wise economies
6. Curtail or reduce stockpiling of idle funds
7. Extend its influence beyond the budget
8. Put the damper on certain categories of budget expenditures.

Differential Costs of Curriculums in Comprehensive Junior Colleges

Ernest F. Anderson

THE OPERATION OF educational programs to train vocational and technical graduates is a purpose which public junior colleges have attempted to realize during recent years. The realization of this purpose has at best shown limited success when the number of graduates of these curriculums is compared with the societal needs in these specialized occupations.

The failure of a large number of junior colleges to develop broad comprehensive programs of vocational and technical curriculums may be attributable in part to the differential in unit cost between the liberal arts and transfer curriculums and the specialized vocational and technical curriculums.

In the large comprehensive junior college all curriculums have a basic component of course work defined as liberal arts or general education. These are courses taken by students in all or almost all of the curriculums of the college. The occupational curriculums designed for preparation of vocational and technical specialists have components of specialized work commonly referred to as "vocational" or "technical" courses in addition to the basic component of liberal arts. Some specialized technical curriculums may have as much as 75 percent of the two-year program made up of the specialized courses and only 25 percent liberal arts components. Curriculums that culminate in law, medicine, teaching, and other professions requiring four or more years of college consist almost entirely of liberal arts.

The unit cost of providing the first two years of a curriculum in a liberal arts college is far different from the unit cost in a large comprehensive institution which offers a curriculum in liberal arts and provides the liberal arts components as well as the specialized courses for all of the vocational and technical curriculums offered. Some very large junior colleges offer as many as 40 specialized curriculums designed to prepare graduates for immediate employment. The cost of specialized components of vocational and technical curriculums in comprehensive institutions will necessarily be higher than the liberal arts components because of the small student-staff ratio in shops and laboratories and the greater quantity of facilities and instructional materials utilized per student. This means that on the average it will cost more per student to provide the specialized vocational and technical curriculums than it costs to provide the liberal arts curriculums designed for transfer. These differences in cost between general and specialized curriculums raise fundamental questions in the planning,

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development, and operation of a state system of comprehensive junior colleges.

Given the present method of financing junior colleges used in most states, the course mix or the proportion of general to special courses in a curriculum, and the curriculum mix, or the proportion of general to occupational curriculums, in the total program are very important considerations for junior colleges because local funds usually have to be allocated to pay the extra cost for the specialized vocational and technical curriculums. As we move more and more to state financing of junior colleges, there should be less concern on the local level about the "extra" costs of special curriculums because the state will be supporting more of these extra costs.

During the development and growth of institutions, officials choose which curriculums to offer and which ones not to provide. When state policy permits, the tendency is for local boards of control to establish and operate the least expensive rather than the curriculums for which individual students and society have the greatest need. An institution must know the unit costs of courses and curriculums so that it can plan for the most economical number of students to admit to a particular curriculum. Yet, new curriculums that lead to employment in developing occupations may have to be established and operated at a high unit cost until enrollments rise to provide a more economical unit cost.

To find out the actual cost differential in operating junior colleges, a study was conducted to determine the relationship of the costs of special vocational and technical curriculums of less than four years to the costs of transfer and liberal arts curriculums leading to programs of study requiring four or more years of college study. Eight publicly supported junior colleges were selected from the population of institutions which met the following criteria in 1964-65: (a) continuous operation as a separate junior college for a minimum of five years, (b) a comprehensive program consisting of common transfer curriculums and at least 10 specialized vocational and technical curriculums of at least one academic year and less than four years in length, (c) a minimum of 2,000 full-time-equivalent students, and (d) high-quality programs as evaluated by junior college specialists in the respective states. The group selected comprised two schools each from California, Florida, Michigan, and New York.

The unit costs of all courses in a curriculum were totaled to determine the total cost of educating a student in that curriculum. The cost of educating a student in each specialized vocational and technical curriculum was then compared with the average cost of educating a student in the liberal arts curriculums at that institution to see if there was a consistent relationship in all eight institutions. The results are shown in Table 1.

All liberal arts and transfer curriculums offered in an institution were grouped together because the courses comprising them consist of a large component of general courses common to almost all the curriculums. This commonality of courses among curriculums results in curriculum unit costs similar for almost all liberal arts and transfer curriculums in an institution. The vocational and technical curriculums have a low proportion of general courses common to all curriculums and a high proportion of specialized courses. This results in a greater variability in unit costs for vocational and technical curriculums than for the liberal arts and transfer curriculums. Therefore, the average cost for the liberal arts and transfer curriculums is a relatively stable basic figure for each institution with which the differential costs of vocational and technical curriculums can be compared. The vocational and technical curriculums were grouped into eight types to facilitate analysis and comparison.

Table 1 shows the number of institutions offering each type of curriculum, the number of curriculums offered in each category, and the average cost ratio for each major type of vocational and technical curriculum. For example, the average cost ratio of the engineering technology curriculums was 1.95. This represents an average for 19 curriculums offered in the eight institutions. The ratio of 1.95 means that in these institutions if it cost $1,000 to educate a student for one year in a liberal arts or transfer program, it costs on the average about $ 1,950 to educate a student in the engineering technologies. This figure includes expenditures for current operation and excludes expenditures for original equipment, capital outlay, and debt service.

Only two institutions in the group offered one curriculum each in applied arts. The average ratio for these two curriculums was 1.76. The number of curriculums and institutions represented in this category is too small to be useful in generalizing to other institutions of like character.

The findings of this study are sufficient to show that the next stage in the analysis to determine the differential costs of junior-college curriculums is necessary. The conclusions can be made more precise by data that institutions can now readily develop by use of an improved design for unit-cost analysis. Items of cost, such as capital outlay for buildings and equipment, teaching supplies, auxiliary services, and pupil personnel services, can be allocated with sufficient accuracy to courses and student credit hours, if an institution desires these types of data. When this is done, propositions and hypotheses that will provide a basis for more specific and detailed conclusions can be projected and tested. This type of research will rapidly improve the present state of knowledge about the cost of educating students in comprehensive junior colleges.

TABLE 1.—RATIO OF VOCATIONAL AND TECHNICAL CURRICULUM UNIT COSTS IN EACH OF EIGHT CATEGORIES TO THE UNIT COSTS OF LIBERAL ARTS CURRICULUMS IN EIGHT INSTITUTIONS, 1964-65

Categories	Number of institutions	Number of curricula	Average ratio (Liberal arts = 1.00)
1	2	3	4
Liberal arts	8	...	1.00
Applied arts	2	2	1.76
Engineering technologies	8	19	1.95
Business and office occupations	8	46	.95
Health and medical occupations	7	14	1.49
Industrial technical occupations	6	19	1.22
Dietetics and home economics occupations	2	7	1.21
Public service occupations	4	7	.96

Through the utilization of these findings educational planning can be facilitated. Trends in enrollments in various curriculums will provide a basis for projecting costs. Then, investment in education can be evaluated better than at the present.

A Factor Analysis of 17 Indexes of the Cost-Quality Relationship in the Two-, Three-, and Four-Year High Schools of Pennsylvania

Thomas S. Hamill

THE PURPOSE OF THIS STUDY was to discover the common factor basic to 17 indexes of the cost-quality relationship. A secondary purpose was to discover the interrelationships of 17 indexes of the cost-quality relationship. One hundred twenty-three two-, three-, and four-year high schools with enrollments in excess of 400 pupils were selected for study. On the basis of data collected from records maintained in the Pennsylvania State Education Department 17 indexes of the cost-quality relationship were computed.

Through statistical methods, the study isolates the factors from 17 indexes which previous studies, knowledgeable people, and personal experience have deemed to be associated with the cost-quality relationship of education. This study isolates by Rao's Canonical method of factoral analysis the factors of cost-quality present in the two-, three-, and four-year high schools of Pennsylvania, and by analyzing their origin in the data, tentatively indentifies their nature.

This study also points out the interrelationship of the 17 indexes and discusses significant findings.

Research pertaining to the cost-quality relationship in public schools was carefully reviewed. The Pennsylvania State Superintendent of Public Instruction, the Director of the Research Bureau, the Director of the Bureau of School Business, and the Chairman of the Pennsylvania Governor's Committee on Education cooperated.

The 17 indexes of the cost-quality relationship selected were:

1. Enrollment
2. Ratio of enrollment
3. Pupils-per-teacher ratio
4. Pupils-per-administrator ratio
5. Pupils-per-clerk ratio
6. Pupils-per-guidance counselor ratio
7. Dollars spent per teacher on in-service growth
8. Dollars spent per pupil on library books
9. Average education of teachers
10. Average experience of the teaching staff
11. Average salary of the teaching staff

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12. Expenditure-per-pupil ratio

13. Supply-expenditure-per-pupil ratio

14. Instructional - expenditure - per-pupil ratio

15. Local effort (mills on market value)

16. Market - value - per - resident - pupil ratio

17. Basic - account - standard - reimbursement fraction.

The records of 137 schools were searched at the Pennsylvania Department of Public Instruction and the enrollment was recorded, clearly naming the two-, three-, and four-year high schools that met the criterion of 400 or more pupils.

The data in this study were statistically treated by the following steps:

1. Each index was computed from the collected information.

2. Each index was ranked; and the range, average rate of increase, median, mean, and standard deviation were computed.

3. The rank, range, average rate of increase, median, mean, and standard deviation were visually examined for inconsistencies in the data.

4. The Pearson product moment of correlation was computed for each index with every other index of the 17 by 17 matrix.

5. Each correlation was tested at the 1 and the 5 percent levels of confidence, and the significant correlations were recorded.

6. The correlations were examined for significant findings.

7. Rao's Canonical Factor Analysis was computed on the 17 by 17 correlation matrix by use of the IBM 650 Computer. The program used was adapted from one written by C. W. Harris and W. H. Pierce of the University of Wisconsin.

8. The residue from the factor analysis was tested by Lawley's test of significance until no significant factors remained.

9. Five common factors were isolated by means of the factor analysis. They were rotated by Thurston's single plane graphical method to give clarity and meaning to each of the common factors.

10. The five common factors were described and identified for future investigation.

The conclusions of this study are presented below. Although they do not comprise all that may be derived from the study, they seem to be the most relevant to the purpose of this investigation.

1. The 17 indexes of the cost-quality relationship were composed of five significant factors. They were:

The dynamic youth factor
The application of money factor
The operations of supply and demand factor
The response for the correction of inertia factor
The pilot school aspirations factor.

2. The dynamic youth factor was characterized by more highly educated, youthful teachers receiving a higher average salary in a school district spending more per pupil on instruction and supply. This accounted for approximately 20 percent of the variance in the cost-quality relationship.

3. The *application of money factor* was characterized by larger expenditures for library books, for total expenditures, for supply expenditures, and for instructional expenditures. This factor accounted for approximately 12 percent of the variance in the cost-quality relationship.

4. The *operations of supply and demand factor* was characterized by increased enrollment with demands for additional staff, higher average teacher salaries, but with lower pupils-per-administrator ratios. This factor accounted for approximately 16 percent of the variance in the cost-quality relationship.

5. The *response for the correction of inertia factor* was characterized by increased expenditure for library books, in-service growth to compensate for faculty deficiencies, low pupil-clerk ratios, and low pupil-guidance counsellor ratios. This factor accounted for approximately 20 percent of the variance in the cost-quality relationship.

6. The *pilot school aspirations factor* was characterized by wealthy communities' putting forth a significant effort to reduce class size and to supply the best in instructional facilities and usable supplies. In these communities the pupil-administrator ratio was high but was compensated for by an improved pupil-teacher ratio. This factor accounted for approximately 32 percent of the variance in the cost-quality relationship.

7. Higher enrollments were found in those communities that had a higher pupil-teacher ratio, higher pupil-administrator ratio, lower number of dollars spent per teacher on in-service growth, higher average salary of the teaching staff, higher market value per resident pupil, or a lower basic-account-standard-reimbursement fraction.

8. A higher ratio of enrollment was associated with a lower average salary of the teaching staff, a lower per-pupil expenditure, a lower instructional expenditure per pupil, a lower market value per resident pupil, and a higher basic-account-standard-reimbursement fraction.

9. A lower pupil-teacher ratio was found in school districts where any or all of the following conditions existed: a lower enrollment, a lower pupil-per-teacher ratio, a lower average experience of the teaching staff, a higher expenditure per pupil, a higher supply expenditure per pupil, a higher instructional expenditure per pupil, and a lower market value per resident pupil.

10. A lower pupil-guidance counsellor ratio was found in the school districts where any or all of the following conditions existed: lower pupil-teacher ratio, a lower average experience of the teaching staff, a higher expenditure per pupil, a higher instructional expenditure per pupil, a lower basic-account-standard-reimbursement fraction.

11. A greater number of dollars spent per teacher on in-service growth was found in school districts where any or all of the following conditions existed: a lower enrollment, a greater expenditure of dollars on library books, a lower average experience of the teaching staff, a higher per-pupil expenditure, a higher supply expenditure per pupil.

12. A higher number of dollars spent per pupil on library books was found in school districts where any or all of the following conditions existed: a lower pupil-teacher ratio, a higher number of dollars spent per teacher on in-service growth, a higher expenditure per pupil, a higher supply expenditure per pupil, a higher instructional expenditure per pupil, or a lower basic-account-standard-reimbursement fraction.

13. A higher education of the teaching staff was found in those communities where any or all of the following conditions existed: a higher average salary of the teaching staff, a higher average experience of the teaching staff,

a higher expenditure per pupil, a higher supply expenditure per pupil, a higher instructional expenditure per pupil, a higher market value per resident pupil or a lower basic-account-standard-reimbursement fraction.

14. The higher experience of teachers was found where any or all of the following conditions existed: a higher average education of the teaching staff, a higher average salary of the teaching staff, a lower supply expenditure per pupil, a higher pupil-clerk ratio, a higher pupil-guidance counsellor ratio, a lower number of dollars spent per teacher on in-service growth, or a lower number of dollars spent per pupil on library books.

15. A higher average salary was found in those communities where any or all of the following conditions existed: a higher average education of the teaching staff, a higher average experience of the teaching staff, a higher supply expenditure per pupil, a higher instructional expenditure per pupil, a higher market value per resident pupil, a higher enrollment, a higher pupil-administrator ratio, a higher local effort, a lower ratio of enrollment, a lower pupil-teacher ratio, or a lower basic-account-standard-reimbursement fraction.

16. A higher expenditure per pupil was found in communities where any or all of the following conditions existed: a lower ratio of enrollment, a lower pupil-teacher ratio, a lower pupil-clerk ratio, a lower pupil-guidance counsellor ratio, a higher number of dollars spent per teacher on in-service growth, a higher number of dollars spent per pupil on library books, a higher average education of the teaching staff, a higher average salary of the teaching staff, a higher instructional expenditure per pupil, a higher supply expenditure per pupil, a higher local effort, a higher market value per resident pupil, or a lower basic-account-standard-reimbursement fraction.

17. A higher supply expenditure per pupil was found in those communities where any or all of the following conditions existed: a lower pupil-teacher ratio, a lower pupil-clerk ratio, a higher number of dollars spent per teacher on in-service growth, a higher number of dollars spent per pupil on library books, a higher average education of the teaching staff, a lower average experience of the teaching staff, a higher average salary of the teaching staff, a higher total expenditure per pupil, a higher instructional expenditure per pupil, a higher market value per resident pupil, or a lower basic-account-standard-reimbursement fraction.

18. A higher local effort was found in those communities where any or all of the following conditions existed: a lower pupil-teacher ratio, a higher average salary of the teaching staff, a higher total expenditure per pupil, a higher instructional expenditure per pupil, or a lower basic-account-standard-reimbursement fraction.

19. A higher market value per resident pupil was found in those communities where any or all of the following conditions existed: a higher enrollment, a lower ratio of enrollment, a lower pupil-teacher ratio, a lower pupil-clerk ratio, a higher average education of the teaching staff, a higher average salary of the teaching staff, a higher expenditure per pupil, a higher supply expenditure per pupil, a higher instructional expenditure per pupil, or a lower basic-account-standard-reimbursement fraction.

20. The higher basic-account-standard-reimbursement fraction was found in those communities where any or all

of the following conditions existed: a lower enrollment, a higher ratio of enrollment, a higher pupil-teacher ratio, a higher pupil-clerk ratio, a higher pupil-guidance counsellor ratio, a lower number of dollars spent per pupil on library books, a lower average education of the teaching staff, a lower average salary of the teaching staff, a lower per-pupil expenditure, a lower supply expenditure per pupil, a lower instructional expenditure per pupil, a lower local effort, and a lower market value per resident pupil.

Variations in Costs Among Attendance Centers in a Large High School District: A Cost Study

F. Dee Sanford

THE PURPOSE OF this case study was to identify the variations in costs of education among attendance centers in a large high school district and to relate these variations to selected demographic characteristics of neighborhoods and to quality measures of the school program. The wide variations in per-student costs among school districts throughout the nation raised the general hypothesis that variations in socioeconomic characteristics of attendance areas within a large school district should be reflected in variations in selected characteristics of the school program, including balance of study-centered and activity-centered course enrollments, expenditures per pupil, dropout rate, and college attendance.

Method of Procedure

The United States censuses of population and housing for 1960 were used to establish property values, income levels, educational achievement, and other essential socioeconomic data for the six attendance areas within the Sequoia Union High School District on the San Francisco Peninsula. Costs for each school were divided into four general categories: (*a*) study-centered courses, (*b*) activity-centered courses, (*c*) co-instructional activities, and (*d*) facilitating services.

Enrollments were determined according to course offerings in each school, and costs for each course and activity were reduced to a per-student basis. These results were then related to selected census data to assess the relationship of all known information.

Results

Considerable variation was found among the school attendance areas in the basic socioeconomic factors. The median family income ranged from a low of $6,302 in one attendance area to a high of $11,094 in another. Income was closely related to the types of positions held by men. The greater the percent in professional, management, office, and proprietorship positions, a range from 20.7 to 49.2, the greater the income for the area.

This pattern also held true for median school years completed by persons

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25 years of age and over, the high-income area having a median of 13.52 years and the low-income a median of 11.43 years. In the high-income area 23.3 percent of the adult population had not completed high school; in the low-income area, 52.9 percent.

Another characteristic that followed the pattern was that of home value. In the highest-income area the median home value was $26,762. In the highest-income area the ratio of home value to annual income was 2.41; in the lowest-income area, 2.10.

The lowest-income attendance area had greater percentages of Negroes and other minority groups than any other area. In 1960, Negroes accounted for 27.92 percent of the population in the low-income area (that percentage has since risen to 75). The higher-income areas had only 0.34, 0.04, and 0.02 percent Negroes.

Teachers in the older schools in general received higher salaries because of progression on the salary schedule; the order of the schools on average salary, from highest to lowest, was the same as the order of the schools from the date of opening. To eliminate the effect of this source of variation, all salaries were adjusted to the district average. This made possible the adjustment of costs in the four major divisions of expenditures. The number of students enrolled in each class was divided by the average daily attendance for the school to obtain the percentage that the enrollment in each class contributed to the total average daily attendance for the year. The students per class by subject areas were computed for each school.

Schools in the low-income attendance areas of the district had the highest cost per unit of average daily attendance. The low-income areas were high in per-student expenditures and the high-income areas were low in per-student expenditures.

There was a relationship between family income and the courses in which students enrolled. In the low-income area, 57.41 percent of the total average daily attendance was contributed by enrollments in study-centered courses. At the opposite end of the scale, the high-income area contributed 65.07 percent of the total average daily attendance from enrollments in study-centered courses. The other schools of the district maintained their rank order in this area just as they had in total cost per unit of attendance and in family income. Enrollment in activity-centered courses followed a reverse pattern, inasmuch as activity-centered courses make up the balance of the total units of average daily attendance.

The low-cost schools spent a larger percent of the total budget for study-centered courses, even though the expenditures per student in these areas were less than those of the high-cost schools. More students were enrolled in remedial courses in the high-cost schools. At the lowest-income school, remedial courses accounted for 11.01 percent of the total enrollment; as income increased, percents of enrollments in remedial courses decreased: 4.74, 4.07, and 1.67. These courses tend to have fewer students per class (about 60 percent of regular class size), and to cost about 50 percent more on a per-pupil basis than the regular classes.

With some exceptions, such as physical education, activity-centered courses tend to be more costly than study-centered courses; other courses, such as art and industrial arts, tend to be considerably more costly. The demand for the expensive courses is more pronounced in the high-cost schools where enrollments in art and industrial arts are greater than in the low-cost schools.

Co-instructional activities within a school contribute to the educational program but cannot be charged to a specific course offering. The library service, counseling, and school principals are examples of these services. These costs seem to be more directly related to the size of the school than to the nature of the instructional program because the small school will have professional library staff and school administrators equivalent to those in the large school and additions to the staff are made because of size and not primarily because of program.

Costs for facilitating services were related to several factors, the chief ones being the size of the school and the physical condition of the school plant. At a small school where a minimum staff is necessary to carry on the program, the costs per student are considerably higher than in a large school where the pupil-staff ratio is somewhat lower. Plant maintenance was also a major factor at the second-lowest-income school where the cost per pupil was $55.53 compared with the district average of $24.98. Even so, there was a tendency for the high-cost schools to be high in this area and for the low-cost schools to be low.

Student achievement was measured by the Differential Aptitude Test Battery given to all incoming freshmen of September 1961. The results show a relationship among the income of the parents, the vocation of the father, the general educational achievement of adults in the attendance area, and the cost of the school program. Students from the high-income attendance areas achieved higher scores on the test than did students from low-income areas. The pattern was consistent in all phases of the test, and the rank order of school attendance areas according to test scores followed the rank order in the areas discussed above.

School Finance and Urban Ecology

G. Alan Hickrod

THE PURPOSE OF this study was to demonstrate the relevance of urban ecology as a perspective for research in educational administration with special attention to school finance.[1] The study also describes two empirical studies carried out in the greater Boston metropolitan area. It is to the principal findings of these two quantitative studies and to the policy implications of the findings that the present discussion is directed. The two studies are identified in this paper as the "dispersion" study and the "impact" study. A detailed report of the impact study will appear in another place.[2]

The Dispersion Study

In this study, the dispersion of 11 social and economic school district characteristics was observed for 73 districts in the greater Boston area at two points in time, 1949 and 1959. Six of these characteristics were conceptualized as aspects of the human resources of a school district and five were defined as fiscal characteristics of a district.[3] Two dimensions of dispersion were investigated. The first was a measurement of disparity or inequality for the entire group of 73 districts, and the second was a measurement of disparity between two sectors *within* the metropolitan area. One of these sectors consisted of a group of geographically contiguous affluent school districts and the other sector consisted of a group

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[1] Urban ecology combines material from both sociology and economics. A representative sample of this literature would probably include:

Bowman, Mary J., and Haynes, W. W. *Resources and People in East Kentucky.* Washington, D. C.: Resources for the Future, 1963. 448 p.

Duncan, Otis D., and others. *Metropolis and Region.* Baltimore: Johns Hopkins Press, 1960. 587 p.

Perloff, Harvey S., and others. *Regions, Resources, and Economic Growth.* Baltimore: Johns Hopkins Press, 1960. 716 p.

Schnore, Leo F. *The Urban Scene.* New York: Free Press of Glencoe, 1965. 374 p.

Theodorson, George A., editor. *Studies in Human Ecology.* Evanston, Ill.: Row, Peterson and Co., 1961. 568 p.

Vernon, Raymond. *Metropolis 1985.* Cambridge: Harvard University Press, 1960. 252 p.

[2] Hickrod, G. Alan. "Ecological Changes Within a School District and Expenditure for Education." *American Educational Research Journal* 4: 243-52; May 1967.

[3] All data in both the empirical studies come from the published reports of either the U. S. Bureau of the Census or from the annual reports of the Department of Education, Commonwealth of Massachusetts. The six "human resource" variables were proportion of persons 25 years old and over with four years or more of college education, an occupational index consisting of the ratio of professional and managerial to craftsmen and operatives, proportion of persons 25 years of age and over with education beyond high school, proportion of males classified as operatives, median income of families and unrelated individuals, and proportion of males classified as professionals. The five fiscal characteristics were expenditure per pupil in net average membership for current expenditures from all sources, expenditure per pupil in net average membership for current expenditures from local sources, state adjusted property valuations per pupil in net average membership, an effort index based on income, and an effort index based upon property valuations.

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of geographically contiguous underprivileged districts. The respective sectors were identified by a map overlay process. The statistical techniques used consisted of the Gini index or coefficient of concentration, which was used for the entire metropolitan area, and a standard score procedure, which was used for disparity between the two sectors.[4]

The two principal findings were as follows:

1. With regard to fiscal characteristics, the school districts of this metropolitan area appeared to be more alike at the end of the decade than they were at the beginning of the decade. However, simultaneous with this trend, two sectors *within* the metropolitan area appeared to be more unlike at the end of the decade than they were at the beginning of the decade. Support was given, therefore, to a notion of increasing equality for most school districts occurring simultaneously with increasing inequality for *some* school districts. This finding supports some broad economic generalizations advanced concerning the nature of the American economy by Myrdal.[5]

2. With regard to human resources, the evidence relating to the entire metropolitan area does not point to a clear finding. However, support was found for the notion of increasing disparity among school districts in human resources *provided* the focus is on sector-to-sector disparity rather than upon disparity in terms of the over-all metropolitan area. Partial support was given, therefore, to notions of increasing school district socioeconomic inequality advanced by Havighurst.[6]

There are three limitations on these findings: (a) These data refer only to a single metropolitan area. (b) The statistical treatment is descriptive only, that is, the trend interpretation may simply be due to sampling error. (c) The unit of analysis was the school district and not the school district weighted for the number of pupils enrolled.

Studies focusing on dispersion can be advanced in at least two directions. Studies comparing several metropolitan areas at more than two points in time would be useful as would studies testing for sampling errors and studies using weighted school district characteristics. However, a richer research approach might be to treat various measures of dispersion as dependent variables and to study their relation to another set of ecological and institutional variables considered as independent variables. For example, both human resource and fiscal disparity among school districts in a given metropolitan area might be expected to vary according to some or all of the following metropolitan characteristics: (a) age of settlement of the area; (b) the region of the United States in which the metropolitan area is located; (c) the amount and kind of land use planning, zoning regulations, building codes, etc. in the area; (d) the economic base and labor force composition of the area; (e) the amount and kind of school district consolidation present; and (f) the magnitude and type of state school support program in existence. Research designs of this nature take the ecological shifts among school districts as the dependent variable and seek to evaluate the effect of other variables upon these shifts. A different approach, perhaps a more useful one in the school finance area, takes the ecological shifts among school districts as independent variables and seek to evaluate the effect of these shifts upon expenditure and fiscal effort for education. This was the task of the second study.

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[4] For a description of these methods see: Gibbs, Jack P. *Urban Research Methods.* Princeton, N. J.: D. Van Nostrand Co., 1961. 625 p.

Applications of the Gini index are discussed in: Duncan, Otis D. "Population Distribution and Community Structure." *Population Studies: Animal Ecology and Demography.* Cold Spring Harbor, L. I., N. Y.: Biological Laboratory, 1957.

[5] Myrdal, Gunnar. *Challenge to Affluence.* New York: Pantheon Books, 1963. 172 p.

[6] Havighurst, Robert J. *Education in Metropolitan Areas.* Boston: Allyn and Bacon, 1966. 260 p.

Havighurst, Robert J. *The Public Schools of Chicago.* Chicago: Board of Education, 1964. 499 p.

The Impact Study

In this study the impact of changes in six socioeconomic characteristics of school districts upon expenditure for education raised from local sources and upon a measure of local fiscal effort for education was observed.[7] The study was a multiple regression analysis that used two stochastic equations for expenditure, one without state aid to the local school district, and one with state aid to the local school district. Two equations were also used for the effort model, one with the state aid variable, and one without the state aid variable. This study does differ in two respects from a number of other local school expenditure studies.[8] First, it was a longitudinal design rather than a cross-sectional design.[9] Second, the study did not assume a rectilinear relationship between the independent and dependent variables.[10] *Fiscal effort* was defined in terms of the "income elasticity" of a school district, i.e., the ratio of percentage change in expenditure to percentage change in income over the decade in question.[11]

The principal findings were:

1. Shifts in the human resources of a school district are related to changes in the support level for public education and to at least one specification of fiscal effort for education. However, while the coefficients of net determination are statistically significant, in a zero slope sense, the magnitudes are large, suggesting that changes in support levels through time are also affected strongly by non-ecological variables.

2. Among the independent variables used in these equations, the change in the percentage of college graduates was the best single predictor of expenditure

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[7] The six characteristics were percentage of persons 25 years old and over with four years or more of completed college education; number of students in net average membership; adjusted property valuations per pupil, NAM; median income of families and unrelated individuals; ratio of the percentage of professional plus managerial workers to the percentage of craftsmen plus operatives; and state aid per pupil contributed to current operating expenditures. Each variable was measured in terms of a percentage change from 1949.

[8] Alkin, Marvin C. "Religious Factors in the Determination of Educational Expenditures." *Educational Administration Quarterly* 2:123-32; Spring 1966.

Brazer, Harvey E., and David, Martin. "Social and Economic Determinants of the Demand for Education." *Economics of Higher Education.* (Edited by Selma J. Mushkin.) U. S. Department of Health, Education, and Welfare, Office of Education, Bulletin 1962, No. 5. Washington, D. C.: Government Printing Office, 1962. Chapter 2, p. 21-42.

Hirsch, Werner Z. "Determinants of Public Education Expenditures." *National Tax Journal* 13:29-40; March 1960.

James, H. Thomas; Thomas, J. Alan; and Dyck, Harold J. *Wealth, Expenditure and Decision-Making for Education.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 1241. Stanford, Calif.: Stanford University, School of Education, 1963. 203 p.

Miner, Jerry. *Social and Economic Factors in Spending for Public Education.* Syracuse, N. Y.: Syracuse University Press, 1963. 159 p.

Sacks, Seymour; Harris, Robert; Carroll, J. J. *State and Local Government: The Role of State Aid.* Albany: New York Department of Audit and Control, 1963.

Expenditure also plays an important role in productivity studies. See: Thomas, J. Alan. *Administrative Rationality and the Productivity of School Systems.* Chicago: Midwest Administration Center, University of Chicago, 1964.

[9] The suggestion for this came partially from an educational psychology study rather than a school finance study. See: Bloom, Benjamin S. *Stability and Change in Human Characteristics.* New York: John Wiley and Sons, 1964. 237 p.

[10] This notion came from demand studies in economics. See especially: Wold, Herman, and Jureen, Lars. *Demand Analysis: A Study in Econometrics.* New York: John Wiley and Sons, 1953. 358 p.

[11] Benson, Charles S. *The Economics of Public Education.* Boston: Houghton Mifflin Co., 1961. 580 p.

change. This finding lends partial support to notions of an educational "feedback effect" advanced by Benson.[12]

3. Change in the amount of state aid available to a local school district does not seem to be as important as change in the human resource composition of a district in determining changes in the level of local support.

There are three limitations on these findings: (a) Once again these data refer only to a single metropolitan area, and further, only to the decade 1949-1959. (b) After the rectilinear assumption has been released, there are many curvilinear possibilities and the best fitting curve may not have been selected for all of the equations. (c) The magnitude of state aid to education was not great in Massachusetts for the decade under consideration, and therefore, this state may not have been the best location to observe the comparative effects of state aid as opposed to human migration on local support of education.

The findings of this longitudinal study can be contrasted with previously reported cross-sectional research. The most obvious contrast is in the lower predictivity of this study. Multiple R squared is about half the value reported by Thomas and much less than that reported by Garms.[13] Perhaps before we accept the amount of "ecological determinism" suggested by the cross-sectional studies, we should have a look at further longitudinal research. The second contrast is with the leading determinant of expenditure level. In a good many studies this has been either income or property valuations.[14] In the study reported here a human resource or human capital variable was the leading predictor. Further research should go into determining the relative contribution of human versus material resources to expenditure determination. Complicating this picture is the suggestion in data reported by Garms and Potter that the rank order of determinants in cross-sectional functions will vary both from region to region and from one point in time to a second point in time.[15]

Research designs concerned with the effects of intra-metropolitan human migration upon school support levels might profit from the "step-wise" procedure used so successfully by Thomas.[16] Perhaps the effects of human resource change should be extracted *first* from the total variation in support level changes. After that, it might then be possible to ascertain the effect of changes in non-ecological variables. For example, does upgrading the competence of administrative officials have a favorable effect upon school support levels *after* human resource migration has been allowed to operate? A very high priority must be given to the exploration of possible lagged relationships. Perhaps changes in the human resource levels of a district are not felt for several years in the budgetary process of a school district. There may also be interaction effects present. For example, it may be that upgrading the competence of administrative personnel when coupled with a simultaneous human resource gain produces a strong acceleration in the support level of a district. There may be other, less obvious interaction effects among the many determinants of change in local expenditure levels and local fiscal effort.

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[12] *Ibid.*

[13] James, H. Thomas; Kelly, James A.; and Garms, Walter I. *Determinants of Educational Expenditures in Large Cities of the United States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 2389. Stanford, Calif.: Stanford University, School of Education, 1966. 198 p.

[14] A number of these studies are cited in: Campbell, Alan K., and Meranto, Philip. "The Metropolitan Education Dilemma." *Urban Affairs Quarterly,* September 1966.

[15] James, H. Thomas; Kelly, James A.; and Garms, Walter I., *op. cit.*

[16] Thomas, J. Alan. *Administrative Rationality and the Productivity of School Systems.* Chicago: Midwest Administration Center, University of Chicago, 1964.

Policy Implications

Policy implications can be noted for the three levels of government. At the local level, regional educational planners might note that disparity is not limited to a central city versus suburban axis, but that policy goals of an equity nature must take into consideration parity or disparity between large sectors consisting of several districts within each metropolitan area. Local-school superintendents would also seem to be well advised to monitor carefully the in- and out-migration of the college-educated within their school districts. Public relations campaigns designed to enlist the support of a group of new emigrants with a college education may pay off handsomely in dollars for education.

At the state level, three considerations might be mentioned. First, if large agglomerations of like socio-economic school districts are developing in at least some metropolitan areas, this may spell considerable trouble for school district consolidation programs. The only course of action available to many disadvantaged districts may be to merge with equally disadvantaged districts that surround it. Progress toward equity goals would be quite slow indeed if this situation is found to be prevalent in many metropolitan areas. Second, if school districts in some metropolitan areas are becoming more alike with regard to a fiscal measurement, such as equalized property valuations, while they are becoming more unlike with regard to human resource specifications, such as educational levels of parents, perhaps equity goals demand that a searching re-evaluation be made of the traditional reliance upon property valuations as *the* measure of ability of a district to support education.[17]

Several possibilities suggest themselves as courses of action for state departments of education: (a) modification of general purpose state aid formulas to include a measurement of a human resource nature, (b) special purpose aid based upon measures of human resources, (c) special aid programs based upon a gain-loss regional accounts system.[18] Finally, at the state level, it may be that the whole notion of aids in cash may have to be re-evaluated in the face of evidence of strong human resource migrations. Perhaps only an aid-in-kind program can offset the loss of college-educated parents in a given school district. One may not be able to replace educational leaders with dollars, only with more leaders.

A much more extensive empirical investigation of human resource migration among school districts is clearly indicated before major policy decisions. However, if even some of the empirical findings reported here hold up under further investigation, the U. S. Office of Education might be well advised to consider the problems and possibilities of launching a counter ecological trend program. A policy goal of equal educational opportunity surely requires more than support to the very poorest sections of the central cities. There are many grey areas in the suburban rings that are also deserving of some kind of attention and help. Whether or not that help is forthcoming will depend upon the value set upon the goal of equal educational opportunity by professional educators and by the voting public relative to other competing public policy goals.

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[17] The classic defense of property valuations as a measure of ability to support education can be found in: Burke, Arvid J. *Financing Public Schools in the United States.* Revised edition. New York: Harper and Brothers, 1957. 679 p.

For a challenge to this position see: Lane, Rodney P., editor. *Special Education and Fiscal Requirements of Urban School Districts in Pennsylvania.* Philadelphia: Fels Institute, University of Pennsylvania, 1964.

[18] For interesting ideas on this last alternative see: Hirsch, Werner Z., editor. *Elements of Regional Accounts.* Washington, D. C.: Resources for the Future, 1964. 221 p.

Taxpaying Ability: A Study of the Relationship Between Wealth and Income in California Counties

Donald L. Davis

As A GENERAL CONCEPT, taxpaying ability is widely used in school finance literature; as a specific term, it is defined with precision in the statutes of many states, but unfortunately, the precise definitions vary so greatly from state to state that they confuse, rather than clarify, descriptions of school finance phenomena.

This study examined two measures of taxpaying ability: wealth, defined as equalized valuation of taxable property, and income, defined as personal income payments. The purpose of this investigation was to determine what differences exist between the two selected measures of taxpaying ability in California counties, and what conditions are associated with these differences, particularly as they pertain to educational services.

Statement of the Problem

Changing conditions in California, caused principally by rapid growth and industrialization, have increased the difficulties of adequately financing public education. Points of view differ sharply concerning the role that the state government should play in the financial support of public schools. A major point of disagreement has concerned the taxpaying ability of local school districts. Ability of local units in California is measured in terms of taxable value of property per pupil in average daily attendance (ADA). However, a number of possibilities for error are imbedded in this definition:

1. The first possibility for error is in the process of assessing property. Even under systems where stringent rules exist for guiding the assessor, the process remains largely subjective, and, therefore, vulnerable to human error.
2. The second possibility for error lies in the assumption that valid assessments of property produce valid indexes of taxpaying ability, that all districts of equal valuation per pupil are equally able to pay taxes, an assumption that may not be valid. The availability of data on valuations of property in an earlier period shaped the assumption. Now personal income may be a more valid measurement of taxpaying ability.

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3. The third possibility for error lies in the assumption that districts of equal valuation per pupil are equally in need of funds and will spend similar amounts for education. This assumption ignores community differences in the value attached to education, which may lead communities at one extreme of the values continuum to use all funds from the state to reduce local tax contributions and maintain mediocre educational programs, and communities of similar ability but on the other extreme of the values continuum to exert unusual effort and maintain superior programs.

Views of taxpaying ability are influenced largely by the traditional manner in which local units obtain revenue. It is common belief that economic resources are expressed in terms of wealth and that wealth in general is income-producing. However, this need not be true. Taxes which recur annually, regardless of the taxing mechanism, are paid out of income, either past, present, or expected. Thus, it can be argued that the single source of revenue for taxpaying purposes is individual income, and not wealth. To use income itself as an index of ability to pay is to set up a precise relationship between ability and availability. Accordingly, there is an increasing sensitivity being shown to the necessity of linking income more closely to the support of public education. This study presents additional support for establishing this relationship.

Research Procedures

A comparative analysis was made of the 58 California counties on measures of wealth and income per pupil in ADA for the year 1959. The difference between county ranks on the two ability measures was calculated and reported as a positive or negative discrepancy (D-score). A positive D-score indicated a higher rank on income, a negative D-score indicated a higher rank on wealth. The 58 D-scores were positioned on a discrepancy scale which ordered the county units on a continuum, moving from congruence at the center of the scale to wide difference on each end.

Correlation analyses examined the degree of relationship between the measures of wealth and the measures of income in the counties, and related the two ability indexes to 15 measurements of county performance pertaining to tax administration, land ownership, financial effort, educational expenditures, and educational attainment. The statistical analyses considered the state of California in three dimensions: (a) the 17 urban counties, (b) the 41 rural counties, and (c) the total 58 counties.

Conditions associated with extreme variation between wealth and income were examined in the 11 counties that had D-scores larger than 29, one-half of the N of the study. Six counties had a positive D-score and five counties had a negative D-score. The geographic, demographic, economic, and expenditure characteristics of these counties were reported, and their implications for educational services noted. One aspect of revenue flow between county and state levels was examined to answer the questions: Does a net gain or net loss of revenue occur, as measured by the amount of state apportionment to the county against the amount of state taxes paid by the county; and what is the relationship of this gain or loss to the position of the county on the discrepancy scale?

Results

This study was based on the postulate that there were substantial differences among California counties in taxpaying ability, measured in the two dimensions of wealth and income. This postulate was strongly supported by the research findings.

Given wealth and income as indexes of taxpaying ability, the first question posed in the study was: What differences are there between these measures in California County D-scores on the discrepancy scale range from 46 to −39? Table 1 reports measures of wealth and income per pupil in ADA, ranks, and D-scores for the 58 California counties. The rank-order coefficient of correlation between the measures of wealth and income for the 58 counties was .2. Reduction of the N to the 41 rural counties increased the coefficient of correlation between the measures to .38. However, reduction of the N to the 17 urban counties reduced the coefficient of correlation between the measures to .14.

Given differences between the measures of taxpaying ability, the second question posed in this study was: What significance, if any, do levels of wealth and income have for performance in the counties? Perceptions of tax administration (measured by assessment ratios), patterns of land ownership (measured by government property holdings and by public utility valuations), financial effort for education (measured by tax ratios for wealth and for income), expenditures for education (measured in dollar amounts per pupil in ADA in selected budget categories), and educational attainment (measured by the holding power of schools and by the educational levels of the adult population) were the performance variables selected for analysis.

Substantial relationships were evidenced between wealth or income levels and all selected areas of county performance. The coefficients of correlation revealed that most of the performance variables were more markedly related to wealth than to income. The exceptions to this were tax administration and one measure of educational attainment. Thus, it was indicated that county performance, as measured in this study, was more strongly influenced by levels of wealth than by levels of income. Again, some of the variation between the measures of ability and measures of performance criteria was explained by urban-rural differences. Levels of wealth were a dominant influence in both groupings, but much stronger in the rural counties. Levels of income showed a much greater influence in the urban counties than in the rural grouping.

The third question in this study was: What conditions are associated with wide discrepancies between wealth and income? The examination of geographic, demographic, economic, and expenditure characteristics in 11 counties at the extremes of the discrepancy scale indicated that county position on the variation continuum tended to be associated with urban and rural characteristics.

Wide variations created by high income and low wealth most often occurred in rapidly growing, heavily populated, urban counties. These counties were smaller in land area, had a smaller percentage of government ownership, and spent less money per pupil for education. Measured against wealth (the existing criterion of taxpaying ability in California), these counties made twice the effort of the high-wealth counties to support education; but measured against income, they made only half the effort of the high-wealth counties. Eighty percent of the money paid to the state through

TABLE 1.—COMPARISON OF CALIFORNIA COUNTIES ON MEASURES OF WEALTH AND INCOME PER PUPIL IN ADA

County	Wealth per pupil in ADA	Income per pupil in ADA	Rank		Discrepancy scale D-score
			Wealth	Income	
1	2	3	4	5	6
Alameda	$7,310	$14,277	40	4	36
Alpine	41,305	14,661	2	3	−1
Amador	19,034	9,633	4	34	−30
Butte	9,202	9,563	24	36	−12
Calaveras	11,914	9,788	12	27	−15
Colusa	17,131	13,231	5	8	−3
Contra Costa	7,664	6,778	37	58	−21
Del Norte	6,471	10,339	53	21	32
El Dorado	11,863	8,312	14	51	−37
Fresno	8,718	8,325	27	47	−20
Glenn	12,715	9,601	9	35	−26
Humboldt	6,781	9,713	51	30	21
Imperial	7,493	10,486	39	19	20
Inyo	16,639	8,985	6	45	−39
Kern	9,276	9,066	23	42	−19
Kings	9,497	8,322	22	49	−27
Lake	12,561	9,209	10	40	−30
Lassen	6,384	7,930	54	53	1
Los Angeles	8,904	14,154	26	5	21
Madera	8,934	8,705	25	46	−21
Marin	7,116	12,813	46	9	37
Mariposa	13,871	13,631	7	6	1
Mendocino	7,989	9,065	34	43	−9
Merced	6,862	8,324	50	48	2
Modoc	11,865	11,455	13	2	1
Mono	56,073	15,758	1	2	−1
Monterey	7,828	11,429	35	13	22
Napa	6,933	9,685	49	32	17
Nevada	9,938	9,753	19	28	−9
Orange	7,195	7,742	44	56	−12
Placer	8,223	7,805	32	55	−23
Plumas	25,806	9,516	3	38	−35
Riverside	7,801	9,228	36	39	−3
Sacramento	5,302	11,316	58	14	44
San Benito	12,346	10,803	11	18	−7
San Bernardino	7,279	8,320	42	50	−8
San Diego	5,856	11,754	56	10	46
San Francisco	12,880	29,256	8	1	7
San Joaquin	7,606	10,032	38	22	16
San Luis Obispo	10,505	10,833	18	17	1
San Mateo	8,487	13,463	30	7	23
Santa Barbara	10,796	11,608	16	11	5
Santa Clara	7,152	10,341	45	20	25
Santa Cruz	8,262	10,937	31	16	15
Shasta	8,059	7,596	33	57	−24
Sierra	9,720	9,875	21	24	−3
Siskiyou	7,002	9,831	47	26	21
Solano	5,441	10,027	57	23	34
Sonoma	6,995	9,094	48	41	7
Stanislaus	5,960	7,885	55	54	1
Sutter	11,106	9,701	15	31	−16
Tehama	8,632	9,521	28	37	−9
Trinity	7,281	11,187	41	15	26
Tulare	7,262	9,005	43	44	−1
Tuolumne	10,777	9,871	17	25	−8
Ventura	9,901	9,720	20	29	−9
Yolo	9,571	9,683	29	33	−4
Yuba	6,539	8,098	52	52	0

sales and personal income taxes was returned to these high-income counties in the form of school apportionment aid.

Wide variations created by high wealth and low income most often occur in sparsely populated, relatively stable, rural counties. These counties had larger land areas, a higher percentage of government ownership, much higher agricultural and mineral productions, and spent more money per pupil for education. Ninety-two percent of the money paid to the state through sales and personal income taxes was returned to these high-wealth counties in the form of school apportionment aid.

Conclusions

The principal conclusion drawn from the data presented in this study was this: The relationship between wealth and income per pupil in ADA in California varied greatly from one county to another, and between urban and rural county groupings. It was even probable that the data of this study underestimated the magnitude of these variations.

The discrepancies evidenced between the measures of taxpaying ability give cause to argue that California's present criterion of wealth imputes to the high-wealth counties ability that, on the basis of income, they do not possess. If this is true, the ability of high-wealth counties to finance education may be exaggerated in relation to the foundation program measures based on a uniform property tax rate and the existing state school apportionment system. Even though wealth per pupil in ADA is high, these counties can raise equivalent sums of money only by apportioning a relatively greater share of income to taxes.

Correlates of Educational Expenditures in Medium-Sized School Districts

Educational Expenditures in Large City School Districts 1950-1960

David N. Evans
and
Conrad H. Potter

WITH FEW EXCEPTIONS, public finance theorists have shown little interest in problems related to financing public education. Similarly, with the exception of a few leading contributions, the literature of public school finance until recently has likewise shown little awareness of the more global problem of allocating community resources among the competing services of government. Early students of school finance often adhered closely to the viewpoint that education is a unique branch of government, supported through decisions independent of and unrelated to other services of government. Public finance investigators, on the other hand, argue for a balancing of preferences for education along with preferences for other public programs.

James, early in the current series of school finance investigations at Stanford University, hypothesized that somewhere in the relatively unexplored structure of underlying values that shape demands for education probably lie some data which, when revealed, will provide new insights for both groups of investigators.[1] This assumption, coupled with the observations that equality in both the educational opportunity available to children and the property tax payments made to support public education are generalized values in our society, have led, for nearly a decade, to a series of studies that approach the problem of

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[1] James, H. Thomas. *School Revenue Systems in Five States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 803. Stanford, Calif.: Stanford University, School of Education, 1961. 143 p.

Further developed in: James, H. Thomas; Thomas, J. Alan; and Dyck, Harold J. *Wealth, Expenditure and Decision-Making for Education.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 1241. Stanford, Calif.: Stanford University, School of Education, 1963. 203 p.

resource allocation for education in theoretical terms.[2]

Under James' direction the School Finance studies group at Stanford University has been attempting to develop a general rationale relevant to the ordering of the study of state school finance systems.[3] The rationale developed thus far postulates three inductively derived conditions essential to the public support of schools: (a) the ability to pay for educational services, (b) the demand of the residents of the districts for these services, and (c) the influence of various governmental arrangements through which demands are expressed and ability is used to produce the services. The rationale asserts that public expenditure for education [4] is a function of these three conditions.

The three conditions, as defined above, are too abstract for direct measurement. Empirical work with the rationale requires measurable variables that can be used as proxies for the abstractions. For instance, *ability*, defined as the financial resources available for the support of education, is routinely measured by variables that have been extensively studied in traditional approaches to school finance.[5] A set of four proxy variables was selected for purposes of these studies to measure or reflect a school district's ability: assessed value of taxable property per pupil in ADA, median family income, percentage unemployed, and average ratio of assessed value to full value of property. Property values were either used as reported at full value or were obtained by adjusting assessed values with the appropriate ratio. Median family income data were obtained from school district sources.

A second set of four variables was selected to measure demand for educational services: median years of schooling obtained by the adult population, percentage of owner-occupied housing, average daily attendance, and percentage nonwhite living in the community.

The School Finance Studies group has extended the analysis of the governmental arrangements by examining the process and structures for decision-making through which funds are allocated to the public schools in the large cities of the United States, hereafter called the Large School Finance Study.[6] The rationale suggested the inclusion of a third set of four independent variables to be taken as proxies for the governmental structure for decision-making:

1. Tax assessor is elected or appointed.
2. Business manager reports directly to the board or to the superintendent.
3. Board approves the budget, or another agency has the power to reduce the budget.
4. Board selection is by ward or at large.

The general hypothesis tested in the Large School Finance Study is: *If*

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[2] *Ibid.*

[3] *Ibid.*

[4] In this study, this dependent variable is more precisely defined as "expenditures per pupil in average daily attendance."

[5] Burke, Arvid J. *Financing Public Schools in the United States.* Revised edition. New York: Harper and Brothers, 1957. 697 p.

Chisholm, Leslie L. *The Economic Ability of the United States To Finance Public Schools.* New York: Teachers College, Columbia University, 1936. 169 p.

Mort, Paul R. *State Support for Public Education.* Washington, D. C.: American Council on Education, 1933. 496 p.

Norton, John K. *The Ability of the State To Support Education.* Washington, D. C.: National Education Association, 1926. 88 p.

[6] James, H. Thomas; Kelly, James A.; and Garms, Walter I. *Determinants of Educational Expenditures in Large Cities of the United States.* U. S. Department of Health, Education, and Welfare, Office of Education, Cooperative Research Project No. 2389. Stanford, Calif.: Stanford University, School of Education, 1966. 197 p.

factors of demand for education and factors of financial ability to pay for education are held constant among school districts, variations in the governmental structure for financing education are associated with variations in educational expenditures.

The analysis included data assembled from district, state, and federal records on expenditures for education for the 1959-60 school year for 107 of the 119 districts in the nation with an average daily attendance of 25,000 or more pupils. Over 70 percent of the variance in expenditures per pupil was accounted for by the economic, social, and governmental measures used. An excellent summary of these findings has been prepared by Garms.[7]

Statement of the Problem

Potter and Evans further extended the analysis of selected characteristics of school districts in large cities of the United States. Potter replicated the Large School Finance Study for the year 1959-60 with corresponding data drawn from the same school districts for the 1949-50 school year to determine whether the relationships between the independent variables and the dependent variable were similar to another point in time. Evans examined the relationship in a sample of smaller school districts (with enrollments of 11,000 to 25,000) in 1960. Multiple regression techniques were used to relate these variables to the dependent variable, current expenditures per pupil in average daily attendance.

The purpose of this study was to determine whether relationships among the characteristics observed in the large districts were similar in the smaller districts. A further purpose of these studies was to apply appropriate tests of statistical significance to a comparison of multiple regression analysis in the two samples.

Methodology

The methodology for the Evans study rested on two assumptions: (a) that size of the district, when considering districts above 16,000 enrollment, is of negligible influence on expenditures; and (b) that coterminality of school districts and city can be assumed even when the school district's boundaries are not identical with a major census body. The Potter study also rested upon the second assumption.

The first assumption was supported by a study of previous investigations of the relationhip between district size and unit costs and by a routine check to determine whether maldistribution of the cities on a size continuum was sufficient to distort analyses by multiple regression.

The second assumption was also tested through the use of the data gathered during the Large School Finance Study. In the study of expenditures of large school systems, many of the 107 districts were found not to be coterminous with city or county boundaries; in each case the data used were adjusted by adding or subtracting census tracts to obtain an accurate reflection of that characteristic for the school district. Subsequently, regression coefficients for the unadjusted census data and for the adjusted data were compared; no significant differences were revealed. This analysis supported assumption that variations in degree of coterminality can be ignored. These studies, therefore, used the census information for the largest population center which lay within the boundaries of the school system.

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[7] Garms, Walter I. "The Financial Characteristics and Problems of Large School Districts." *Educational Administration Quarterly* 3:14-27; Winter 1967.

Dependent Variable

The dependent variable in these studies was current expenditures per pupil. Information concerning it was obtained from the U. S. Office of Education. The general procedure was to divide a district's current expenditures by its ADA. However, because of a lack of agreement among school districts in the method used to compute current expenditures and ADA, the Office of Education adjusted the data so as to obtain comparable figures for current expenditures per pupil.

Independent Variables

The Large School Finance Study is the third in a series of studies employing a rationale that postulates three major determinates of educational expenditures. The three determinates, as formulated in this series, are:

1. Financial ability of the community to support the public schools.
2. Demands for education, as generated by the social characteristics of a local community and its expectations for educational services.
3. Governmental arrangements affecting the way the schools utilize the abilities of and respond to the demands of the community.

In the development of the rationale for these studies, it was necessary to find measurable variables which could serve as proxies for the postulated factors of ability, demand, or governmental arrangements. The variables chosen to represent factors of ability and demand were separate conceptually but tended to be correlated with each other. Thus, variables which measure ability also tend to some degree to measure demand. In general, while the variables chosen to represent the effect of governmental arrangements on school expenditures were not highly correlated with ability and/or demand, they did in some way affect them. The general hypothesis with regard to these governmental arrangements is that they either facilitate or hinder the expression of ability or demand in the determination of school expenditures.

Data Collection

The early stages of the Large School Finance Study were spent in identifying and then analyzing relevant variables, refining their descriptions, and then seeking ways to quantify them. Data on the sets of variables relating to expenditures, ability, demand, and governmental arrangements were translated for computer processing.

Sampling

The sample selected for the Evans study was that of 88 of the 98 school districts with 16,000 to 25,000 pupils in ADA as reported by the U. S. Office of Education.[8] The sample for the Potter study was that of 85 of the 107 districts used in the Large School Finance Study. Twenty-two districts were eliminated because complete data for them were not available. The U. S. Office of Education provided attendance data for the cities in the sample.

Statistical Techniques Used To Test the Hypotheses

The principal statistical method employed in these studies was that of multiple regression. The 95 percent confidence bands for the standard regression coefficients were also computed. The partial correlation coefficients and the zero order correlation coefficients for each independent variable with the dependent variable were also reported. Potter also tested the significance of differences between the means and standard deviations.

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[8] Kahn, Gerald. *Current Expenditures per Pupil in Large Public School Systems, 1959-60.* U. S. Department of Health, Education, and Welfare, Office of Education, Circular No. 677. Washington, D. C.: Government Printing Office, 1962. 27 p.

Findings and Conclusions

A comparison of the interrelationships between the independent variables used in the Evans study revealed general agreement. There were, however, significant differences between the means of four of the 15 variables. In three of these cases the differences were in the expected direction; the fourth variable, percent of owner-occupied housing, did not conform to expectations.

The three variables with significant but not unexpected differences were log of ADA, percent of nonwhite, and percent of elementary-school children enrolled in private schools. As expected, there was a higher percent of resident nonwhites in the large than in the small school districts. There was also a higher percentage of children enrolled in private schools in the large districts. There was, of course, a significant difference in log of ADA, the variable used to identify the two samples.

An analysis of the variable, percent of owner-occupied housing, yielded many interesting findings. One of the most significant was that in small school districts there was a higher percent of owner-occupied housing than in large school districts. A significant difference was also identified between the zero order correlations of the two samples. These findings are inconsistent with what is generally known about the relationship between school expenditures and owner-occupied housing. Furthermore, these findings may be of enough importance to warrant further investigation of the relationship between percent of owner-occupied housing and voter and taxpayer behavior.

Another finding of interest is that while in the major study the regression coefficients for five of the seven ability or demand variables were significantly different from zero, in this replication only median family income and percent of elementary-school children attending private schools were significantly different from zero. Only one regression coefficient for the governmental variables was significantly different from zero. This variable, school board elected vs. appointed, was significantly different in both samples. The only regression coefficient to undergo a dramatic change in direction was median years of schooling. In the large school districts, this coefficient is positive, while in the medium-size school districts, the coefficient is negative.

When 95 percent confidence intervals were established, Potter found that none of the 1950 multiple regression coefficients was significantly different from zero.

Potter also sought to determine whether relationships among the variables were similar over time. To do this, he tested the significance of differences between the means and standard deviations of the temporal pairs of variables, and finally, he computed a rank correlation to see whether there were similarities in the relationships among the variables in 1950 and 1960. He found that there were similarities.

The tests of the means revealed that several were significantly different. For example, we know that population decreased between 1950 and 1960 in many of the large cities. School populations, on the other hand, as reflected by total average daily attendance, increased even in those cities that experienced a decline in total population. The test of differences of the means for

1950 and 1960 revealed these changes to be statistically significant.

Although millions of Negroes have migrated to the larger urban areas and have presumably had important effects on the educational expectations of these communities, a test of the differences of the means of the variable, percent nonwhite, revealed that there was no significant difference between 1950 and 1960 for the large school districts. This finding is perhaps accounted for by the fact that Negro migration had its greatest impact on a relatively few cities.

Significant differences were found between means of assessed valuation per pupil in ADA and median family income for 1950 and 1960. Assessed values increased from $10,724 in 1950 to $13,697 in 1960. Median family income jumped from $3,393 in 1950 to $5,995 in 1960, an increase of 77 percent.

There was also a significant difference in median years of schooling of the adult population. The mean was 10.33 years in 1950; it rose to 11.04 years in 1960. As might be expected, there were also significant differences in expenditures per pupil in ADA. The mean expenditure per pupil in ADA in 1950 was $233.45 as compared with $362.15 in 1960. This represents a mean increase of $128.60, or 55 percent, in 10 years. The 77-percent increase in median family income, in contrast to a 28-percent increase in assessed valuation, suggests that ability to support education, as measured by income, increased much more rapidly than ability as measured by property; since the latter is the basis upon which schools are most dependent, we see why expenditures did not increase at the same rate as income.

That there are no significant differences between the means for 1950 and the means for 1960 of any of the governmental variables is to be expected, providing still another indication that institutional arrangements tend to change more slowly.

The tests of the significance of differences between the standard deviations of the variables for 1950 and 1960 reveal that for six variables, the pairs were significantly different. These included assessed valuations per pupil in ADA, median family income, percent owner-occupied housing, median years of schooling, percent unemployed, and average ratio of assessed to full value of property. None of the pairs on two of the ability variables, assessed value per ADA and median family income, was significantly different. Smaller standard deviations in 1950 indicated more homogeneity in these variables in 1950 than in 1960. Also, the partial correlation coefficients among these variables were lower in 1950.

From Potter's analysis it is clear that the relationships among the selected variables used in these studies have changed over time. The major hypothesis of Potter's study, that the variables selected would yield similar explanations of variations in expenditures in 1950 and in 1960, was not confirmed, although the multiple correlation coefficients were significant for both years.

However, for 1950, a multiple correlation coefficient of .59, significant at the .01 level, provides further evidence of the reliability of the model, though this coefficient is much smaller than that found for 1960 (.90). This change in the power of the selected variables to explain variations in school expenditures in large school districts over time suggested the possibility of changes in the variables; tests revealed significant change between 1950 and 1960 in several of the variables.

When the general hypothesis of the Evans study was tested, it was found that differences in size between the two samples did not significantly affect the statistical findings, and, therefore, the results of the Large School Finance Study can be generalized to school districts with ADA's of 11,000 to 25,000.

The research findings of these studies provide further support for the rationale developed in the school finance studies at Stanford University.

Factors Influencing New Interest Costs of Bonds for School Purposes

Charles C. Hudson

THE PURPOSE OF THIS study was to identify and analyze factors influencing net interest costs of bonds for school purposes and to make recommendations for the improvement of bonding procedures.

Bond issues for school purposes in Indiana during the period July 1, 1960, through June 30, 1965, were studied.

Procedure

Pertinent literature and research and major Indiana statutes concerning bond issues for school purposes were reviewed. Data for the study were obtained from the *Weekly Bond Buyer,* records in the State Department of Public Instruction, Indiana State Teachers Association circulars, and interviews with school officials.

Totals of amounts and numbers of issues were calculated for the 258 bond sales reported for Indiana schools, July 1, 1960, through June 30, 1965. Net interest costs were reported on 223 of the 258 issues. Net interest costs were adjusted to minimize variations owing to fluctuations in the general bond market by determining each issue's deviation from the bond market average net interest cost for the week of sale and adding a constant. Medians and ranges of net and adjusted net interest costs were analyzed for the 223 issues. For bond issues of $500,000 or more, adjusted net interest costs as affected by lengths of issues, school tax rates, and percentages of bonded debt were analyzed by scattergrams and computer program BMD 02R stepwise regression. Tabulations were made by day of bond sales and month of bond sales, and the appropriate median adjusted net interest costs were determined. Scattergrams showed bond issue ratings against adjusted net interest costs.

Selected local school officials representative of corporations with bond issues rated, respectively, Aaa, Aa, A, and Baa were interviewed concerning their understanding and role of obtain-

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ing and maintaining a bond issue rating.

Principal Findings of the Study

1. Indiana state authorities and state agencies issued no bonds for school purposes during the period July 1, 1960, through June 30, 1965.

2. Indiana has no state guarantees against possible default of bond obligations by corporations authorized to issue bonds for school purposes.

3. The annual principal amount of bonds issued for school purposes increased 135 percent during the five-year period.

4. School building corporation bond sales were increasing, and comprised 87 percent of all bonds for schools in Indiana during fiscal 1964-65.

5. The median term of bond issues approximately doubled during the five-year period, and median net interest costs rose from 0.27 percent below market average to 0.05 percent above market average.

6. School building corporation bond issues in Indiana characteristically had longer terms, larger amounts, and higher net interest costs than general obligation bond issues.

7. The median adjusted net interest cost was lowest on Wednesdays. Bond issues were most frequent in June. The first and last quarters of the calendar year had the lowest medians of adjusted net interest costs.

8. Coefficients of multiple correlation R, calculated for data from 102 bond issues of $500,000 or more, revealed the following:

$R_1 = 0.862$ between adjusted net interest costs

$R_2 = 0.8795$ between adjusted net interest costs and the combined effect of lengths of terms and percentages of bonded debt

$R_3 = 0.8853$ between adjusted net interest costs and the combined effect of lengths of terms, percentages of bonded debt, and school tax rates.

Each of the coefficients of multiple correlation was significant at the .01 level of confidence.

9. Statistically the lengths of terms factor explained 73.03 percent of the variance in adjusted net interest costs of bond issues of $500,000 or more. The percentage of bonded debt increased the explained variance percentage about 2.32 percent. School tax rates added only 0.58 percent to the explained adjusted net interest cost variance.

10. Coefficients of multiple correlation R, for the 81 school building corporation bond issues in the original 102-issue sample, were as follows:

$R_1 = 0.6856$ between adjusted net interest costs and lengths of terms

$R_2 = 0.7294$ between adjusted net interest costs and combined effect of lengths of terms and percentages of bonded debt

$R_3 = 0.7563$ between adjusted net interest costs and the combined effect of lengths of terms, percentages of bonded debt, and school tax rates.

Coefficients R_1 and R_2 were significant at the .01 level of confidence, and R_3 was significant at the .05 level of confidence.

11. Statistically the lengths of terms explained 47.0 percent of the variance in adjusted net interest costs of the 81 school building corporation bond issues mentioned above. The percentages of bonded debt increased the explained variance 6.2 percent. School tax rates added 4.0 percent to the total explained variance in adjusted net interest costs.

12. The regression equation for the sample of 102 bond issues of $500,000 or more for school purposes was:

$$Y = 0.04606\,X_1 + 0.04415\,X_2 + 0.01008\,X_3 + 1.86322$$

Where:

Y = predicted adjusted net interest cost
X_1 = length of term
X_2 = school tax rate
X_3 = percentage of bonded debt
1.86322 = a constant.

The numerical values are the calculated regression coefficients.

13. The regression equation for the sample of 81 school building corporation bond issues of $500,00 or more was:

$$Y = 0.02927\,X_1 + 0.04896\,X_2 + 0.00895\,X_3 + 2.31308$$

Where:

Y = predicted adjusted net interest cost
X_1 = length of term
X_2 = school tax rate
X_3 = percentage of bonded debt
2.31308 = a constant.

The numerical values are the calculated regression coefficients.

14. There was wide variation in the understanding and practice of school officials interviewed concerning procedures for obtaining and maintaining a bond issue's rating.

15. Only 67 of the 102 bond issues of $500,000 or more obtained a Moody's rating.

16. Rated school building corporation bonds were all Baa, A, or Aa with an over-all adjusted net interest cost range of 1.07 percent.

17. Statistically, the effect of lengths of issues, school tax rates, and percentages of bonded debt explain 0.61 percent of the 1.07 net interest cost range above. The remaining 0.46 percent is attributed to difference in bond rating, bond marketing preparation and procedures, quality of prospectus preparation, provision of rating information, and other unmeasured factors.

18. There was a high negative correlation between ratings of school building corporation bond issues and adjusted net interest costs.

Major Conclusions

The major conclusions from the findings of this study are as follows:

1. Many Indiana taxpayers are paying excessive net interest costs on bond issues for schools.

2. Longer lengths of terms are a major cause of most Indiana school building corporation bond issues having higher net interest costs than general obligation bond issues.

3. Local school officials can significantly influence net interest costs for school purpose bonds in Indiana.

4. The responsibility of local school officials in Indiana to understand long-term debt programs has increased in recent years as the size and total amount of bond issues for schools increased.

5. Indiana school officials need more guidance in bond marketing techniques. Differences in the level of understanding of bond marketing and rating procedures, prospectus preparation, and local determinants of net interest cost contribute to variances in net interest costs.

6. The state has shown little interest in encouraging the sale of state revenue bonds by authorities or commissions to aid local school districts.

7. The state has made little or no effort to aid local school districts in obtaining lower net interest costs by guaranteeing payment of bond obliga-

tions or by purchasing bonds of fiscally weak school districts.

Recommendations

1. The Indiana Association of Public School Superintendents should sponsor a study to help local school superintendents assume leadership in local bonding programs.

2. The length of term of a bond issue should be as short as practical.

3. Bonds should not be issued in peak tax years.

4. School districts should reduce bonded debt as much as practical before issuing new bonds.

5. A study should be made of the feasibility of state guarantees of local bond and lease-rental obligations and of supplementing local bond issues with issues of an authority, commission, or agency of the state.

A Method of Predicting Educational Expenditures

Marvin B. Wampler

AN IMPORTANT FUNCTION of administration is forecasting. In educational administration, forecasts are routinely made concerning enrollments, revenues, expenditures, and a host of related factors that eventually affect the day-to-day operation of schools. Decisions have to be made today which will not have the full impact for at least a decade from now. Because of this, we need to make decisions that, to the greatest possible extent, must serve the needs of the future.

Projections should not be regarded merely as predictions but as a tool for present planning. The test of their usefulness is not whether statements made today have to prove accurate 10 years from now, but whether they have helped us to make more prudent decisions. Therefore, projections must not be considered one-shot undertakings, but rather as a continuing effort. We try to anticipate the future, but must continue to observe developments as they unfold and to correct our projections when previously unknown factors come into play, or when previous judgments need to be corrected. Therefore, the accuracy of forecast is not as important as the effects of the decisions made relative to the forecast. This in no way changes the need for good forecasting. Local, state, and national forecastings of educational cost are essential to sound planning.

Forecasting educational costs is complex. The forecaster must relate such cost sensitive items as population projections, enrollment ratios of the various age groups, the cost per student of the various age groups, and teacher costs per student for the same age groups to other complex components of the total cost matrix. Those components related to population increases can be extended with considerable confidence because techniques for extending population growth are well developed. Predicting from components that involve policy decisions is far more hazardous.

The purpose of this study was to test, and then apply to California data, a model suggested for predicting school costs by a committee of the Organization for European Economic Co-operation.[1] The model, as suggested by this group, shows the quantitative aspect of educational expansion expressed by the number of students

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[1] Svennilson, Ingvar, and others. *Targets for Education in Europe in 1970.* Policy Conference on Economic Growth and Investment in Education, Washington, 1962. p. 36-37.

enrolled in each age group. The number, S_i, is the product of the size of the population of the age group concerned, P_i, and its specific enrollment ratio e_i. Thus:

$$S_i = P_i \cdot e_i \qquad (1)$$

The total number of students equals the sum of all the S_i.

In addition to quantity there is a quality factor in education. The cost of education can be regarded as a product of the quantity and quality factors. If we designate by C_i the cost per student in age group $_i$, the total expenditure on that age group, U_i will, according to (1), be:

$$U_i = S_i \times C_i = P_i \times e_i \times C_i \qquad (2)$$

The cost figure, C_i, is dominated by teachers' salaries; *normally they* amount to about 70 percent of total current costs. The size of class and the number of hours per teacher determine the ratio of teachers to students, t_i. Let us assume that the average annual salary per teacher for age group S_i is W_i. *The teacher cost per pupil* is the $t_i \times W_i$. Let us further assume that the relation of total cost per pupil to teacher cost per pupil is $(1+k_i)$; where k_i is the relation of other than teacher cost to teacher cost per pupil:

$$\frac{C_i}{W_i \cdot t_i} = (1+k_i) \qquad (3)$$

The cost per student may then be expressed as a product of three factors:

$$C_i = t_i \times W_i \times (1+k_i) \qquad (4)$$

By combining (2) and (4) we get the total cost for one age group of students:

$$U_i = P_i \times e_i \times t_i \times W_i \times (1+k_i) \qquad (5)$$

We then arrive at total current expenditure on education U by aggregating expenditure for age groups U_i. Alternatively, we may define the cost factors—enrollment ratio, teacher-pupil ratio, teachers' salaries and the "other costs" factor—as averages weighted by the school population on each age group. We may then write:

$$U + P_a \times e \times t \times W \times (1+k) \qquad (6)$$

Where P_a indicates the population in the age group on all levels of education.

This expression indicates the economics of education as determined by its internal structure. A given expenditure may be distributed in different ways according to various combinations e_i, t_i, W_i, and k_i.

Predicting future school enrollment is a matter-of-course activity for public-school administrators. In recent years our predictive ability has been *considerably sharpened and we proceed* with a great deal of confidence. We become pressed and less certain, however, when faced with the task of predicting the impact of changing enrollment on our school expenditure levels. It is increasingly necessary that those responsible for public-school expenditures find the means of bringing the accuracy of predicting enrollment growth to the predicting of operating costs. It is to this end that this study has been committed.

It was found that utilizing the model, $U = S \times t \times W \times (1+k)$,[2] it was possible to predict expenditures for the year 1960 by using data available prior to 1954. The range of predictions varied from a low of $1,571,000,000 to a high of $1,881,000,000 with actual expenditures of $1,616,960,415. Although the actual expenditure was closer to the lower prediction than to the higher one, the degree of accuracy was great enough to make this a useful method of making financial forecasts.

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[2] Where U is the symbol for expenditures, t × W stands for teacher expenditure per pupil, and (1 + k) the other-than-teacher cost. Expenditures, for each level of education are found, and then a summation for total expenditures is made.

To further test this model, predictions were made for the year 1965 by using four estimates of population. Three were found by the progression ratio method and the fourth by the enrollment ratio process. In this instance the enrollment estimate computed by the enrollment ratio was higher than any of the three predicted by the progression ratio. The four predicted expenditures are shown below:

Projection One	$2,783,700,977.
Projection Two	$2,814,045,071.
Projection Three	$2,846,475,720.
Projection Four	$2,925,125,001.

The actual cost for the year 1965-66 should be available in the very near future.

Again, this should mark a valid indicator of the values of using this model. Further projections were made for 1970-71 by using basically the same population estimates made for 1965-66 and projections found by this method are given below:

Projection One	$4,361,509,738.
Projection Two	$4,455,747,781.
Projection Three	$4,559,094,995.
Projection Four	$4,655,489,638.

Of course, we will not know the accuracy of these forecasts until data are available for the year 1970-71.

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